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THE MEXICAN AND CENTRAL AMERICAN LIZARDS OF THE GENUS SCELOPORUS

BY

HOBART M. SMITH

WALTER RATHBONE BACON SCHOLAR
SMITHSONIAN INSTITUTION

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CONTENTS

PAGE

List of Illustrations 5
Introduction 9
Geographical Trends in Variation 12
Biotic Provinces of Mexico 14
Regional Lists 19
Method of Treatment 23
Definition of the Genus 28
Arrangement of the Species in Groups 29
Key to the Groups of *Sceloporus* 30
Systematic List 32
Formosus Group 32
Spinosus Group 59
Undulatus Group 172
Graciosus Group 176
Grammicus Group 177
Megalepidurus Group 199
Poinsettii Group 209
Variabilis Group 236
Merriami Group 284
Maculosus Group 290
Chrysostictus Group 294
Siniferus Group 300
Utiformis Group 324
Scalaris Group 330
Pyrocephalus Group 361
Bibliography 378
Index 395

LIST OF ILLUSTRATIONS

PLATES

1. *Sceloporus formosus formosus*, Chilpancingo, Guerrero.
   Sceloporus merriami annulatus, Glenn Spring, Texas.
2. *Sceloporus asper*, Uruapan, Michoacán.
3. *Sceloporus salvini*, Jalapa, Vera Cruz.
   Sceloporus formosus malachiticus, Boquete, Panama.
4. *Sceloporus lundelli lundelli*, Hacienda Balchacaj, Campeche.
   Sceloporus orcutti licki, San Bartolo, Lower California.
5. *Sceloporus lunaei*, Guatemala.
   Sceloporus lundelli gaigeae, Merida, Yucatan.
6. *Sceloporus acanthinus*, type of *S. guentheri*.
7. Head scales of *Sceloporus acanthinus* (from type of *S. guentheri*).
8. *Sceloporus edwardtaylori*, Tehuantepec, Oaxaca.
9. *Sceloporus melanorhinus*, Hacienda El Sabino, Michoacán.
10. *Sceloporus melanorhinus*, ventral views of specimens on Plate 9.
11. *Sceloporus spinosus spinosus*, Maravatio, Michoacán.
    Sceloporus spinosus spinosus, El Salado, San Luis Potosí.
    Sceloporus spinosus spinosus, Alseseca, Puebla.
    Sceloporus horridus horridus, Chilpancingo, Guerrero.
12. *Sceloporus horridus albiventris*, Tepic, Nayarit.
    Sceloporus horridus horridus, Cuernavaca, Morelos.
13. *Sceloporus olivaceus*, Rio Grande City, Texas.
14. *Sceloporus olivaceus*, Huasteca Cañon, near Monterrey, Nuevo León.
15. *Sceloporus magister magister*, Kanab, Utah.
    Sceloporus clarkii boulengeri, Presidio, Sinaloa.
16. *Sceloporus heterolepis* (from Boulenger), Jalisco.
    Sceloporus microlepidotus disparilis, Rio Grande City, Texas.
17. *Sceloporus pictus*, Acultzingo, Puebla.
    Sceloporus pictus, Puebla.
    Sceloporus megalepidurus, Totalco, Vera Cruz.
18. *Sceloporus ferrariperezi binocularis*, between Pablillo and Alamar, Nuevo León.
    Sceloporus serrifer plioporus, Limón, Tamaulipas.
19. *Sceloporus couchii*, Huasteca Cañon, near Monterrey, Nuevo León.
    Sceloporus couchii, Sabinas Hidalgo, Nuevo León.
20. *Sceloporus cozumelae*, Cozumel Island, Yucatan.
    Sceloporus aeneus bicanthalis, Cruz Blanca, Vera Cruz.
    Sceloporus scalaris scalaris, Mexico City.
21. *Sceloporus teapensis*, San Agustin, British Honduras.
22. *Sceloporus variabilis variabilis*, Tierra Colorado, Vera Cruz.
    Sceloporus variabilis variabilis, Las Vigas, Vera Cruz.
23. *Sceloporus variabilis smithi*, Quiengola Mountains, near Tehuantepec, Oaxaca.
24. *Sceloporus chrysostictus*, Yucatan.
    Sceloporus squamosus, Tapachula, Chiapas.
25. *Sceloporus siniferus*, between Rincon and Cajones, Guerrero.
    Sceloporus siniferus, El Treinte, Guerrero.

26. *Sceloporus utiformis*, Hacienda El Sabino, Michoacán.
Sceloporus utiformis, Uruapan, Michoacán.
27. *Sceloporus jalapae*, Chazumba, Oaxaca.
Sceloporus jalapae, Canada de Morelos, Puebla.
28. *Sceloporus nelsoni*, Mazatlan, Sinaloa.
29. *Sceloporus pyrocephalus*, Hacienda El Sabino, Michoacán.
Sceloporus pyrocephalus, north of Rio Balsas, Guerrero.
30. *Sceloporus pyrocephalus*, ventral surfaces of specimens shown in Plate 29.
31. *Sceloporus gadoviae*, Hacienda El Sabino, Michoacán.

TEXT FIGURES

PAGE

1. The biotic provinces of Mexico 15
2. Nomenclature of head scales of *Sceloporus* employed in the present paper. 23
3. Phylogeny of the groups of *Sceloporus* 28
4. Phylogeny of the *formosus* group 33
5. Distribution of *Sceloporus asper*, *S. salvini*, and *S. formosus formosus*. . . 36
6. Distribution of *Sceloporus formosus smaragdinus* and *S. f. malachiticus* in Central America 42
7. Phylogeny of the *spinosus* group 59
8. Distribution of the primitive forms of the *spinosus* group. 67
9. Head scales of the type of *Sceloporus edwardtaylori* 79
10. Distribution of *Sceloporus melanorhinus*, *S. spinosus spinosus*, and *S. s. caeruleopunctatus* 88
11. Distribution of the subspecies of *Sceloporus horridus* and *S. olivaceus*. . . 99
12. Distribution of the subspecies of *Sceloporus clarkii* and *S. orcutti* 120
13. Distribution of the subspecies of *Sceloporus magister* in Mexico 148
14. Variation in number of femoral pores in the subspecies of *Sceloporus magister* 167
15. Phylogeny of the *grammicus* and *megalepidurus* groups 178
16. Lateral nuchal scales of *Sceloporus grammicus*. 181
17. Lateral nuchal scales of *Sceloporus microlepidotus microlepidotus* 185
18. Distribution of the forms of the *grammicus* group 197
19. Distribution of *Sceloporus megalepidurus* and *S. pictus* 200
20. Head scales of *Sceloporus megalepidurus* 205
21. Phylogeny of the *poinsettii* group 209
22. Head scales of *Sceloporus serrifer serrifer* 211
23. Distribution of *Sceloporus serrifer*, *S. ferrariperezi*, and *S. bulleri* 213
24. Head scales of *Sceloporus ferrariperezi ferrariperezi* 215
25. Head scales of *Sceloporus bulleri*. 217
26. Head scales of *Sceloporus mucronatus mucronatus* 218
27. Distribution of *Sceloporus mucronatus*, *S. cyanogenys*, and *S. poinsettii* . . 219
28. Head scales of *Sceloporus mucronatus omiltemanus* 220
29. Head scales of *Sceloporus cyanogenys*. 222
30. Head scales of *Sceloporus poinsettii* 223
31. Head scales of *Sceloporus lineolateralis* 225
32. Head scales of *Sceloporus jarrovii jarrovii* 226
33. Distribution of *Sceloporus lineolateralis* and *S. jarrovii* 228
34. Head scales of *Sceloporus jarrovii minor* 229
35. Head scales of *Sceloporus jarrovii immucronatus* 231

PAGE

36. Head scales of *Sceloporus ornatus ornatus* 232
37. Distribution of *Sceloporus ornatus* and *S. dugesii* 233
38. Head scales of *Sceloporus ornatus caeruleus* 233
39. Head scales of *Sceloporus dugesii dugesii* 234
40. Head scales of *Sceloporus dugesii intermedius* 235
41. The postfemoral dermal pocket of *Sceloporus variabilis marmoratus* . . . 237
42. Phylogeny of the *variabilis*, *maculosus*, and *merriami* groups 238
43. Distribution of *Sceloporus couchii*, *S. teapensis*, and *S. cozumelae* 241
44. Head scales of *Sceloporus parvus parvus* 252
45. Distribution of *Sceloporus variabilis* 264
46. Distribution of *Sceloporus maculosus*, *S. parvus*, and *S. merriami* 284
47. Head scales of *Sceloporus maculosus* 292
48. Phylogeny of the *siniferus* group 300
49. Distribution of *Sceloporus carinatus* and *S. siniferus* 302
50. Distribution of *Sceloporus ochoterenae* and *S. cupreus* 306
51. Head scales of *Sceloporus ochoterenae* 309
52. Distribution of *Sceloporus squamosus* 320
53. Distribution of *Sceloporus utiformis* and *S. gadoviae* 326
54. Phylogeny of the *scalaris* group 331
55. Head scales of *Sceloporus jalapae* 334
56. Distribution of *Sceloporus jalapae*, *S. goldmani*, *S. scalaris*, and *S. chrysostictus* 335
57. Distribution of *Sceloporus aeneus aeneus* and *S. a. bicanthalis* 357
58. Phylogeny of the *pyrocephalus* group 362
59. Distribution of *Sceloporus nelsoni* and *S. pyrocephalus* 369

THE MEXICAN AND CENTRAL AMERICAN LIZARDS OF THE GENUS SCELOPORUS

BY HOBART M. SMITH[1]

INTRODUCTION

The lizards of the iguanid genus *Sceloporus* form one of the largest, most progressive, and most recent groups among the reptiles of the New World. Their evolutionary success is accompanied by great variability, and since distribution is continuous, with frequent intergradation through chains of subspecies, and with the further difficulty that aberration is sometimes difficult to distinguish from geographic variation, the taxonomy of the genus is especially difficult. Attractive problems in species formation and geographical distribution are presented, and their solution is brought within reach by the fact that these lizards are frequently abundant and relatively easy to observe and collect. The problems in this genus were recommended by Cope "as an excellent *pièce de résistance* for those persons who do not believe in the doctrine of derivation of species."

Authors who have dealt with the genus as a whole have disagreed to a surprising extent in their arrangement and evaluation of the species. They tend to extremes, either recognizing individual variants as named forms, or lumping distinct forms under a single name. Boulenger's "Revision of the lizards of the genus *Sceloporus*" of 1897 may be cited as an example of the lumping tendency and Cope's treatment in "The Crocodilians, Lizards, and Snakes of North America" tends toward splitting. More recently, C. E. Burt has combined under single names species which are here regarded as distinct.

Conditions for a detailed study of the genus are now more propitious than at any previous time; the collections now available far more nearly approach adequacy for the solution of the main problems; and the application of the modern concept of geographic races solves many of the difficulties which perplexed the students of the past century.

The importance of familiarity with the creatures in life, of seeing them in their natural environments, and of having fresh material to study in the laboratory can scarcely be overemphasized. In the course of my own field experience in Mexico, I have had the

[1] Walter Rathbone Bacon Scholar, Smithsonian Institution.

advantage of observing and collecting 69 of the 95 recognized forms in their natural surroundings. Material from certain critical areas is still lacking, and more direct evidence of relationships is frequently to be desired. The conclusions now presented are accordingly tentative.

My studies on the genus *Sceloporus* began in the fall of 1932, and have been pursued throughout the subsequent years as time permitted. Beginning in the attempt to identify specimens collected in Mexico during the summer of 1932, the studies were expanded in following years. With renewed expeditions to Mexico, emphasis has been placed on the Mexican and Central American groups of species within the genus. The subgroups found north of the Mexican border in the United States are being studied in detail by Dr. Clinton V. MacCoy and Dr. Charles E. Burt. Hence the synopsis given here of the *undulatus* and *graciosus* groups, which fall mainly within the borders of the United States, is brief.

The Graduate Research Council of Kansas University gave financial aid during the scholastic years of 1934 and 1935, materially contributing to the progress of these studies, and making possible the preparation of many of the drawings. The greater part of the work, however, was completed in 1936 and 1937 during tenure of a National Research Fellowship and while laboratory space in an environment favorable for herpetological research was supplied by the Museum of Zoology of the University of Michigan.

The considerable collections of Mexican reptiles in Field Museum obtained by the Museum's expeditions in 1901, 1903, and 1904 include numerous specimens of various species of *Sceloporus*. This material was examined at Field Museum in the course of repeated visits. The fresh Mexican collections of this genus made by Dr. E. H. Taylor and myself since 1932 amount to 2,996 specimens. Half of this collection, representing 57 species, and including nine of the types of the new forms described, has been deposited in the reference collections of Field Museum of Natural History.

While not yet as complete as might be desired, this study would never have progressed thus far without the opportunities, aid, and encouragement afforded by the tutor under whose direction the problem was originally undertaken, and who has my deepest appreciation—Dr. Edward H. Taylor. I am especially indebted also to Mrs. Helen T. Gaige and Mr. Karl P. Schmidt for many favors and for kindly interest which have been of very material aid.

Numerous other individuals have afforded valuable aid in many ways. I wish to thank in particular Mr. Joseph R. Bailey, Mr.

Reeve Bailey, Dr. Thomas Barbour, Mr. Charles E. Bogert, Sr. Julio Raymond Bresson, Mr. C. D. Bunker, Dr. Doris Cochran, Mr. David H. Dunkle, Dr. E. R. Dunn, Sr. Emilio del Rio, Dr. H. W. Fowler, Mr. F. M. Gaige, Sr. Pedro Galvan, Dr. Howard K. Gloyd, Dr. Joseph Grinnell, Dr. Norman Hartweg, Mr. C. W. Hibbard, Dr. Howard R. Hill, Dr. Carl L. Hubbs, Mr. C. F. Kauffeld, Mr. L. M. Klauber, Dr. H. H. Lane, Dr. Jean M. Linsdale, Mr. Arthur Loveridge, Mr. John T. Martin, Sr. Rafael Martin del Campo, Mr. and Mrs. Robert Miller, Sr. Adolfo Morales, Dr. Walter Mosauer, Dr. George S. Myers, Mr. Walter L. Necker, Mr. M. Graham Netting, Dr. G. K. Noble, Dr. Isaac Ochoterena, Mr. James A. Oliver, Dr. R. H. Painter, Mr. Benjamin Shreve, Mr. Joseph R. Slevin, Dr. Leonhard Stejneger, Dr. L. C. Stuart, Dr. Vasco M. Tanner, Mr. H. Devlin Thomas, Dr. C. F. Walker, Dr. A. H. Wright, and Dr. A. M. Woodbury.

The drawings have been made by Miss Myra Wildish, Mr. Carol Johnson, Mr. Russell Chezem, and Mr. Maxim Eliashevich, all of the University of Kansas, and by Miss Grace Eager of the University of Michigan. Most of the photographs were taken by Mr. Oren Bingham of the University of Kansas and by Mr. F. W. Ouradnick of Ann Arbor, Michigan. The photographs of preserved specimens were taken by immersing the specimens in water between glass plates. Text figure 55 is reproduced through the courtesy of the Biological Society of Washington; text figures 20, 44, 47, and 51 through the courtesy of the Kansas Academy of Science; and text figures 2, 24, 26, 28–32, 34–36, and 38–40 through the courtesy of the University of Kansas.

Material in the following collections has been examined:

KU	Dyche Natural History Museum, University of Kansas.
EHT	Collection of Edward H. Taylor.
ERD	Collection of Emmett R. Dunn.
KSC	Kansas State College, Manhattan.
USNM	United States National Museum.
AMNH	American Museum of Natural History.
MCZ	Museum of Comparative Zoology.
ANSP	Academy of Natural Sciences of Philadelphia.
CM	Carnegie Museum, Pittsburgh.
UMMZ	University of Michigan Museum of Zoology.
FMNH	Field Museum of Natural History.
CHS	Chicago Academy of Sciences.
UU	University of Utah.

BYU	Brigham Young University.
MVZ	Museum of Vertebrate Zoology.
CAS	California Academy of Sciences.
LSJU	Leland Stanford University.
LAM	Los Angeles Museum of Natural History.
LMK	Collection of L. M. Klauber.
WM	Collection of Walter Mosauer.
SDSNH	San Diego Society of Natural History.

The number of specimens included in the scope of this study, in these collections, totals approximately 17,500.

My first opportunity to collect specimens of this genus occurred in the summer of 1929, when I accompanied Dr. and Mrs. Howard K. Gloyd on a brief collecting trip through Kansas, Colorado, and Utah. In the summer of 1930, I again collected with Dr. and Mrs. Gloyd in Texas, New Mexico, Arizona, and California, and in 1931 I accompanied Dr. and Mrs. R. H. Painter in Texas and New Mexico. Introduction to the Mexican forms was made possible by Dr. Edward H. Taylor, whom I accompanied during the summer of 1932 on an expedition covering seventeen central and northern Mexican states. In the summer of 1934 Mr. David H. Dunkle and I again ventured into Mexico, collecting in the northern states. A third trip, which covered most of the other states of Mexico, was undertaken during the summer of 1935. In 1936 Mr. H. Devlin Thomas and I spent several months in Yucatan and Campeche.

GEOGRAPHICAL TRENDS IN VARIATION

Body size and size of scales.—In some groups of reptiles there is an apparent decrease in size of scales from the southern part of the range to the northern. Data derived from the present study of *Sceloporus* do not support this generalization. The forms in which a definite trend toward decrease in size of scales is discernible from south to north are:

Southern	Northern
formosus malachiticus	*f. smaragdinus*
acanthinus (southern)	*acanthinus* (northern)
occidentalis biseriatus	*o. occidentalis*
undulatus undulatus	*u. fasciatus*
undulatus tristichus	*u. elongatus*
graciosus vandenburgianus	*g. gracilis*
variabilis variabilis	*variabilis marmoratus*
pictus	*megalepidurus*

There are practically as many cases in which decrease in size of scales takes place in the opposite direction.

Southern	Northern
formosus smaragdinus	*f. formosus*
orcutti licki	*o. orcutti*
spinosus caeruleopunctatus	*s. spinosus*
microlepidotus microlepidotus	*m. disparilis*
parvus scutulatus	*parvus parvus*
pyrocephalus	*nelsoni*
mucronatus omiltemanus	*m. mucronatus*
squamosus (southern)	*squamosus* (northern)

It has also been suggested that scales tend to decrease in size with increase in altitude. While this seems to be true in some cases, there are as many in which it is not true.

No clear examples of reduction of body size from the southern part of the range to the north, or with increasing altitude, can be discerned in the Mexican forms.

In two groups (*undulatus* and *graciosus*) progressive decrease in size of scales toward the north and with increase of elevation, and decrease in body size from south to north do seem to be demonstrable. These general trends are evidently much more clearly defined in forms occurring north of the 30th parallel. Some members of the *poinsettii* and *spinosus* groups, which fail to show this trend, range northward beyond this limit, but they may be disregarded as belonging to groups with their principal concentration of species and subspecies farther south. Selection of single factors for such correlations is, of course, inherently erroneous, for it is certain that more than one factor is correlated with scale and body size. In Mexico and Central America, where environmental conditions are relatively stable only over small areas, such correlations are bound to be obscure. In the United States, where large areas have relatively uniform environmental conditions, or where changes tend to be more gradual in any given direction, generalizations tend to be more significant.

Trends in breeding habits.—All members of the *poinsettii*, *microlepidotus*, and *formosus* groups, as well as some (perhaps all) members of the *scalaris* group, are ovoviviparous. Schmidt (in Hesse, Allee, and Schmidt, 1937) states that *microlepidotus* is oviparous at the base of Mount Orizaba in Mexico, and viviparous at high levels. This I am inclined to doubt, and Mr. Schmidt and I have searched the literature for the authority for this statement without success.

The species of *Sceloporus* occurring at high altitudes in Mexico and the southern United States are ovoviviparous, oviparous species being entirely excluded, so far as known. All species occurring at elevations above approximately 10,000 feet belong to one of the three groups of ovoviviparous species. As the elevation is decreased,

oviparous species gradually replace the ovoviviparous species in abundance, until at elevations of 1,000 feet or lower, only a few ovoviviparous species occur (e.g., *serrifer, poinsettii, cyanogenys, microlepidotus disparilis*). It is of interest that *Sceloporus* parallels in this respect the condition discovered by Weekes (1933) in Australian lizards of the family Scincidae at high altitudes.

BIOTIC PROVINCES OF MEXICO

The position of Mexico is, as generally recognized, intermediate between the Nearctic and Neotropical regions. The Nearctic region includes the plateau and adjacent mountain ranges, Lower California, and the coasts of Mexico southward approximately to the Tropic of Cancer. The Neotropical region extends northward through Central America to the Isthmus of Tehuantepec, and northward along both coasts. On the Pacific side, the Neotropical region extends nearly to Mazatlán, and up the Rio Balsas basin to southern Puebla; on the east, it extends well north of Tampico, almost exactly to the Tropic of Cancer.

Two of the generally recognized subregions of the Nearctic occur in Mexico: the Rocky Mountain and the Californian. The Californian subregion, however, enters Mexico only in extreme northwestern Lower California. The Neotropical part of Mexico falls entirely within the "Mexican subregion."

Eighty forms of *Sceloporus* occur in Mexico. Fifty-six of these are confined to the Nearctic region, and 18 to the Neotropical. Five, which occur in both regions, seem to be essentially Neotropical; two of these enter the Nearctic through the Balsas basin (*gadoviae, h. horridus*), two over the mountain range south of Lake Chapala (*utiformis, horridus oligoporus*), and one over the middle of the isthmus of Tehuantepec (*variabilis variabilis*).

THE NEOTROPICAL PROVINCES

The Mexican subregion is composed of at least seven provinces which are defined by physiographic, climatic, and faunal characteristics. In this summary they are defined largely on the basis of physiography and of data afforded by the distribution of *Sceloporus*. Climatic data and information on the distribution of other land vertebrates in Mexico, which would be of especial interest for comparison with the system here proposed, are as yet quite inadequate for this purpose. The provinces of the Mexican subregion (in Mexico) thus defined are as follows: Chiapan Plateau (CP), Lower Balsan (LB), Petén (P), Tapachulan (TAP), Tehuantepecan (TEH),

Vera Cruzian (VC), and Yucatecan (YUC). Definition of these provinces with the scelopori occurring in them follow.

Chiapan Plateau.—An elevated region extending westward to the isthmus of Tehuantepec and eastward into Guatemala; its southern edge is marked a few miles inland by a very abrupt, high escarpment which increases in elevation toward the Guatemalan border;

FIG. 1. The biotic provinces of Mexico. Boundary of Nearctic and Neo-tropical regions shown in red. Abbreviations for the provinces: A, Guerreran; AC, Austrocentral; AOC, Austro-occidental; AOR, Austro-oriental; AP, Appalachian; ARIZ, Arizonian; CHI, Chihuahuan; CP, Chiapan Plateau; D, Durangan; LB, Lower Balsan; OH, Oaxacan Highland; PETEN, Petén; SIN, Sinaloan; TAM, Tamaulipan; TAP, Tapachulan; TEH, Tehuantepecan; UB, Upper Balsan; VC, Vera Cruzian; YUC, Yucatecan.

the northern boundary is irregular, much excavated by rivers and valleys.[1]

carinatus *formosus smaragdinus* *variabilis variabilis* (VC, AOR)

Tapachulan.—A coastal region south of the Chiapan Plateau province, extending from a region just west of the western Chiapas border into Guatemala.

acanthinus *squamosus* *siniferus* (TEH, LB)

[1] Abbreviations in parentheses refer to other provinces in which the species or subspecies occurs. If no abbreviation is given, the form is restricted to the province for which it is listed.

Petén.—An area north of the Chiapan Plateau province and on the Atlantic drainage of the isthmus, extending northwest along the coast about to the Rio Papaloapam; on the north, approximately to the 20th parallel; on the west, into Guatemala and British Honduras.

lundelli lundelli
teapensis
chrysostictus (YUC)
serrifer plioporus (VC)

Yucatecan.—The Yucatan Peninsula north of approximately the 20th parallel.

cozumelae
lundelli gaigeae
serrifer serrifer
chrysostictus (P)

Vera Cruzian.—The coastal region north of Rio Papaloapam approximately to the Tropic of Cancer. The region is defined by the absence of certain species of *Sceloporus* as much as by the presence of others.

variabilis variabilis (AOR, CP)
serrifer plioporus (P)

Tehuantepecan.—A semiarid region in Oaxaca, extending southward from the Oaxacan Highland and Austroral provinces to the coast, eastward nearly to the Chiapas border, and westward approximately to the Rio Verde.

edwardtaylori
melanorhinus (LB)
siniferus (TAP, LB)
variabilis smithi

Lower Balsan.—An irregularly outlined area, extending along the coast from the Rio Verde in Oaxaca to a region just south of Mazatlán in Sinaloa; the province extends up the Rio Balsas to northern Oaxaca and southwestern Puebla.

horridus albiventris
ochoterenae
pyrocephalus
gadoviae (UB)
horridus horridus (UB, A)
horridus oligoporus (AOC, AC)
melanorhinus (TEH)
siniferus (TEH, TAP)
utiformis (AOC)

THE NEARCTIC PROVINCES

The Rocky Mountain subregion of the Nearctic is composed (in Mexico, excluding Lower California) of twelve provinces: Oaxacan Highland (OH), Guerreran (A), Upper Balsan (UB), Austro-central (AC), Austro-occidental (AOC), Austro-oriental (AOR), Chihuahuan (CHI), Sinaloan (SIN), Tamaulipan (TAM), Arizonan (ARIZ), Apachian (AP), and Durangan (D).

The Apachian, Durangan, and Sinaloan provinces were proposed by William H. Burt (1938, **39**, pp. 1–77, maps 1–26). The Tamaulipan province is that proposed by J. A. Allen (1892, **4**, pp. 241–243)

and redefined by Dice[1] (1937, **12**, pp. 265–268). The Austro-oriental, Austrocentral and Austro-occidental provinces were defined by Cope (1896, **30**, pp. 1020–25).

Oaxacan Highland.—A small, elevated tract, mostly grassy plains, south of the upper Rio Balsas and the Sierra Oriental; extending southward approximately to San Pedro El Alto, and to the Rio Tehuantepec on the east.

cupreus
spinosus caeruleopunctatus
formosus formosus (A)
jalapae (UB)
microlepidotus microlepidotus (AC, AOC, AOR, A)
mucronatus omiltemanus (A)

Guerreran.—The southern edge of the plateau south of the Rio Balsas in Guerrero and Oaxaca, northward on the east side along the narrow mountain chain to approximately Mirador, Vera Cruz; southward along the eastern mountain ridge to the isthmus of Tehuantepec.

salvini
aeneus bicanthalis (AOR)
formosus formosus (OH)
horridus horridus (UB, LB)
m. microlepidotus (AC, AOC, AOR, OH)
mucronatus omiltemanus (OH)

Upper Balsan.—A desert or semiarid region at the upper limits of the Rio Balsas and near the lower end of the interior plateau (Austrocentral) province. This district occupies a definite path of communication between the Neotropical and Nearctic regions.

pictus
gadoviae (LB)
horridus horridus (LB, A)
jalapae (OH)
spinosus spinosus (AC)

Austrocentral.—A broad area on the interior of the Mexican plateau, bordered on the east, south (except the interval noted above), and west by the peripheral mountain ranges; on the north, the district extends nearly to Saltillo on the east, and beyond Durango (city) on the west. The Upper Austrocentral province encroaches upon the Chihuahuan in the region of northwestern and central Zacatecas.

cautus
dugesii intermedius
ferrariperezi melanogaster
goldmani
jarrovii minor
parvus parvus
scalaris scalaris
aeneus aeneus (AOC)
horridus oligoporus (LB, AOC)
microlepidotus disparilis (TAM, D, AOR)
m. microlepidotus (AOC, AOR, A, OH)
spinosus spinosus (UB)

Austro-occidental.—An area of mountain ridges on the southwest edge of the plateau, extending from northern Nayarit, south of Lake

[1] The Potosian province proposed by Dice is apparently the same as that here called the Austro-oriental.

Chapala, eastward south of Lake Cuitzeo, through the southern part of the Distrito Federal to northwestern Puebla.

asper
bulleri
dugesii dugesii
heterolepis
scalaris unicanthalis
aeneus aeneus (AC)
ferrariperezi ferrariperezi (AOR)
horridus oligoporus (LB, AC)
m. microlepidotus (AC, AOR, A, OH)
utiformis (LB)

Austro-oriental.—Mountainous ridges on the eastern edge of the plateau approximately from Mirador northward to Monterrey.

ferrariperezi binocularis
jarrovii immucronatus
megalepidurus
mucronatus mucronatus
parvus scutulatus
aeneus bicanthalis (A)
ferrariperezi ferrariperezi (AOC)
microlepidotus disparilis (TAM, D, AC)
m. microlepidotus (AC, AOC, A, OH)
variabilis variabilis (VC, CP)

Apachian.—The mountains on the western edge of the plateau northward from central Chihuahua to southeastern Arizona.

undulatus virgatus
jarrovii jarrovii (D)
scalaris slevini (D)

Sinaloan.—Coastal region from a short distance south of Mazatlán to southern Sonora.

clarkii boulengeri
nelsoni

Durangan.—Mountains northward from central Chihuahua southward to northern Nayarit.

jarrovii jarrovii (AP)
scalaris slevini (AP)
microlepidotus disparilis (TAM, AC, AOR)

Tamaulipan.—A broad coastal area southward from the Rio Grande approximately to the Tropic of Cancer.

cyanogenys
olivaceus
variabilis marmoratus
microlepidotus disparilis (D, AC, AOR)
undulatus consobrinus (CHI)

Chihuahuan.—The central area north of the Austrocentral province, east of the western mountain ridges, west of the Tamaulipan province.

couchii
lineolateralis
maculosus
merriami annulatus
ornatus ornatus
ornatus caeruleus
poinsettii
undulatus consobrinus (TAM)
magister magister (ARIZ)

Arizonan.—Eastern Sonora, southward approximately to the Rio Mayo; northeastern Lower California.

clarkii clarkii
magister magister (CHI)

The biotic provinces of Lower California, as supported by data on distribution of *Sceloporus*, appear to be correctly analyzed by

Grinnell (1928). The data furnished by *Sceloporus* do not, however, add to that already available concerning the island faunas, as *Sceloporus* does not seem to have developed island species. The only exception is *S. m. lineatulus*, on Santa Catalina Island, in the Gulf of California. Forms of *Sceloporus* in the peninsular provinces are as follows: Colorado Desert (*m. magister*); San Pedro Martir (*o. orcutti, graciosus vandenburgianus*); San Diegan (*o. orcutti, o. biseriatus*); Vizcaino Desert (*o. orcutti, m. rufidorsum*); San Ignacio (*m. lineatulus, m. monserratensis, o. orcutti*); Cape (*m. zosteromus, o. licki*).

REGIONAL LISTS

The species and subspecies known to occur in each of the various states of Mexico and in the countries of Central America may be listed, as an aid in the identification of small collections.

AGUASCALIENTES

ferrariperezi melanogaster
spinosus spinosus

LOWER CALIFORNIA

graciosus vandenburgianus
magister lineatulus
magister magister
magister monserratensis
magister rufidorsum
magister zosteromus
occidentalis biseriatus
orcutti licki
orcutti orcutti

CAMPECHE

chrysostictus
lundelli lundelli
serrifer serrifer
teapensis

CHIAPAS

acanthinus
carinatus
formosus smaragdinus
mucronatus omiltemanus
siniferus
squamosus
teapensis
variabilis variabilis

CHIHUAHUA

clarkii clarkii(?)
jarrovii jarrovii
magister magister
microlepidotus disparilis
nelsoni
poinsettii
scalaris slevini
undulatus consobrinus

COAHUILA

cautus
couchii
goldmani
jarrovii minor
merriami annulatus
microlepidotus disparilis
olivaceus
ornatus caeruleus
ornatus ornatus
poinsettii
scalaris slevini
undulatus consobrinus
variabilis marmoratus

COLIMA

dugesii dugesii
formosus formosus
horridus oligoporus
melanorhinus
microlepidotus microlepidotus(?)
pyrocephalus
utiformis

DISTRITO FEDERAL

aeneus aeneus
ferrariperezi ferrariperezi
microlepidotus microlepidotus
ochoterenae(?)
scalaris scalaris
spinosus spinosus

DURANGO

horridus oligoporus
jarrovii jarrovii
lineolateralis
magister magister
microlepidotus disparilis
poinsettii
scalaris scalaris
scalaris slevini
spinosus spinosus
undulatus consobrinus

GUANAJUATO

aeneus aeneus
dugesii intermedius
ferrariperezi ferrariperezi
jarrovii minor
microlepidotus disparilis
microlepidotus microlepidotus
scalaris scalaris
spinosus spinosus
variabilis variabilis

GUERRERO

aeneus aeneus
asper
formosus formosus
gadoviae
horridus horridus
horridus oligoporus
melanorhinus
microlepidotus microlepidotus
mucronatus omiltemanus
ochoterenae
pyrocephalus
siniferus
utiformis

HIDALGO

aeneus bicanthalis
ferrariperezi ferrariperezi
jarrovii immucronatus
microlepidotus disparilis
microlepidotus microlepidotus
mucronatus mucronatus
parvus scutulatus
scalaris scalaris
spinosus spinosus
variabilis variabilis

JALISCO

aeneus aeneus
asper
bulleri
clarkii boulengeri
dugesii dugesii
dugesii intermedius
ferrariperezi melanogaster
formosus formosus(?)
heterolepis
horridus albiventris
horridus oligoporus
melanorhinus
microlepidotus microlepidotus
nelsoni
pyrocephalus
scalaris scalaris
scalaris unicanthalis
spinosus spinosus
utiformis

MEXICO

aeneus aeneus
ferrariperezi ferrariperezi
jarrovii minor
microlepidotus microlepidotus
mucronatus mucronatus
scalaris scalaris
spinosus spinosus

MICHOACAN

aeneus aeneus
asper
dugesii intermedius
ferrariperezi ferrariperezi
ferrariperezi melanogaster
gadoviae
horridus oligoporus
melanorhinus
microlepidotus microlepidotus
pyrocephalus
scalaris scalaris
spinosus spinosus
utiformis

MORELOS

aeneus aeneus
ferrariperezi ferrariperezi
gadoviae
horridus horridus
microlepidotus microlepidotus
ochoterenae
siniferus

NAYARIT

asper
clarkii boulengeri
dugesii dugesii
horridus albiventris
jarrovii jarrovii
melanorhinus
nelsoni
scalaris unicanthalis
utiformis

NUEVO LEON

couchii
cyanogenys
ferrariperezi binocularis
jarrovii minor
microlepidotus disparilis
olivaceus
parvus parvus
poinsettii
scalaris slevini
undulatus consobrinus
variabilis marmoratus

OAXACA

aeneus bicanthalis
cupreus
edwardtaylori
formosus formosus
gadoviae
grammicus
horridus horridus
jalapae
melanorhinus
microlepidotus microlepidotus
mucronatus omiltemanus
salvini
siniferus
spinosus caeruleopunctatus
teapensis
variabilis smithi
variabilis variabilis

PUEBLA

aeneus aeneus
aeneus bicanthalis
ferrariperezi ferrariperezi
gadoviae
horridus horridus
jalapae
megalepidurus
microlepidotus microlepidotus
mucronatus mucronatus
mucronatus omiltemanus
pictus
scalaris scalaris
spinosus spinosus
variabilis variabilis

QUERETARO

jarrovii immucronatus
variabilis variabilis

SAN LUIS POTOSI

cautus
ferrariperezi melanogaster
goldmani
jarrovii minor
microlepidotus disparilis
parvus parvus
parvus scutulatus
spinosus spinosus
variabilis variabilis

SINALOA

clarkii boulengeri
horridus albiventris
nelsoni
utiformis

SONORA

clarkii boulengeri
clarkii clarkii
jarrovii jarrovii
magister magister
nelsoni
scalaris slevini
undulatus virgatus

TABASCO

teapensis

TAMAULIPAS

cyanogenys
microlepidotus disparilis
olivaceus
serrifer plioporus
spinosus spinosus
variabilis marmoratus
variabilis variabilis

VERA CRUZ

aeneus bicanthalis
ferrariperezi ferrariperezi
formosus formosus
jalapae
jarrovii immucronatus
megalepidurus
microlepidotus microlepidotus
mucronatus mucronatus
mucronatus omiltemanus
pictus
salvini
serrifer plioporus
spinosus spinosus
teapensis
variabilis variabilis

YUCATAN

chrysostictus
cozumelae
lundelli gaigeae
serrifer serrifer

ZACATECAS

cautus
ferrariperezi melanogaster
horridus oligoporus
jarrovii jarrovii
jarrovii minor
microlepidotus disparilis
scalaris scalaris
spinosus spinosus
undulatus consobrinus

BRITISH HONDURAS

chrysostictus
lundelli lundelli
teapensis

GUATEMALA

acanthinus
formosus smaragdinus
lunaei
lundelli lundelli
serrifer plioporus
siniferus
squamosus
teapensis
variabilis olloporus
variabilis variabilis

SALVADOR

acanthinus
formosus malachiticus
squamosus
variabilis olloporus

HONDURAS

formosus malachiticus
formosus smaragdinus
squamosus
variabilis olloporus

NICARAGUA

formosus malachiticus
squamosus
variabilis olloporus

COSTA RICA

formosus malachiticus
squamosus
variabilis olloporus

PANAMA

formosus malachiticus

METHOD OF TREATMENT

The detailed description of each species is drawn up on a definite plan, from which there is little departure. The descriptions of scutellation are arranged in seven paragraphs, each of which considers a certain set of characters. The general plan, with an evaluation of the characters, follows.

Rugosity and pitting of head scales.—Of varying importance.

Frontal ridges.—Two distinct, rounded ridges originating on the frontal and diverging anteriorly, enclosing between them a distinct depression in the median prefrontal area. Members of the *formosus* group exhibit these structures most clearly.

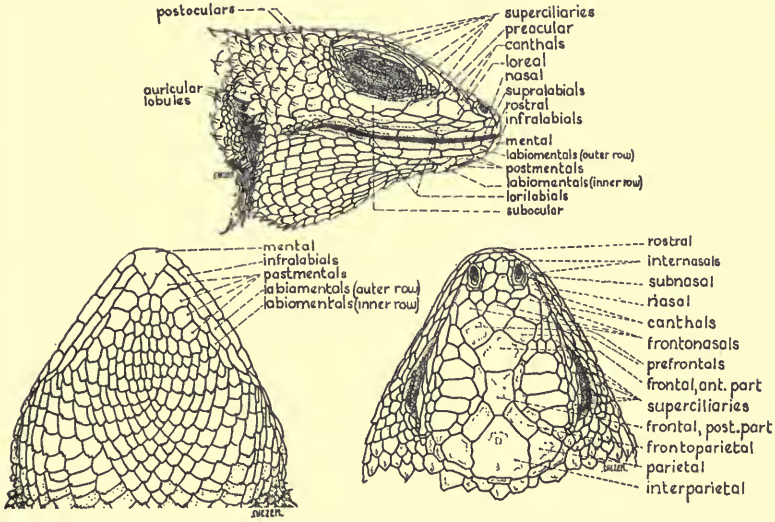

FIG. 2. Nomenclature of head scales of *Sceloporus* employed in the present paper (based on *S. ferrariperezi melanogaster*).

Interparietal (*occipital*).—A large median scale at the posterior edge of the head, always single, with a spot marking the position of the parietal foramen. The scale is usually subquadrate, and its relative size is of some importance. The interparietal is relatively quite large at birth, and gradually decreases in proportionate size as the animal attains greater age. In species which attain greatest size, the interparietal is relatively the smallest.

Parietals.—A single, subtriangular parietal usually borders the interparietal on each side. Occasionally in some species, regularly in others, a second, enlarged, convex parietal occurs posterior to the first.

Frontoparietals.—A single pair of small, rectangular frontoparietals normally precedes the parietals, separating the interparietal from the row of scales about the supraoculars. The frontoparietals may contact each other medially, or may be separated either by an azygous scale or by contact of the frontal with the interparietal. In some species the frontoparietals are usually divided into four scales.

Frontal.—A large scale between the orbits, normally transversely divided into two sections, the anterior somewhat larger than the posterior. In *ornatus* the tendency is to lose the posterior portion of the frontal, probably by fusion with adjacent scales. In *poinsettii* the frontal is usually broken irregularly into several scales. It is significant that in species of the *poinsettii* group in which the supraoculars are in two rows, the frontal rarely touches the interparietal. The reverse is the case in species having a single row of supraoculars. Some species are characterized by having the anterior section or the entire frontal longitudinally divided.

Supraoculars.—A series of enlarged scales above the orbit, in some species divided irregularly, in others in two regular rows, and in still other species quite large and entire. Between them and the median head scales there is usually a single row of small scales which may or may not be complete; the number of supraoculars in contact with the median head scales is of great importance in certain groups, particularly the *spinosus* group. Between the supraoculars and superciliaries there may be one, two, or three complete or incomplete rows of small scales. The number of rows is of importance; in *edwardtaylori*, for instance, there is but one, nearly obsolete row.

Superciliaries.—Six superciliaries are always present, the first four imbricating posteriorly, the fifth completely hidden below the fourth, and the sixth overlapping the posterior part of the fourth. They are occasionally subdivided.

Prefrontals.—Two rather large scales preceding the frontal, in contact medially, or separated either by contact of the median frontonasal with the frontal or by an azygous scale.

Internasals.—Two or four pairs of internasals is apparently the normal condition, but this arrangement is seldom realized. The scales are usually irregularly divided.

Postrostrals.—A row of two to six scales between the rostral and the nasals and internasals; sometimes further subdivided. The number, whether two or more, may be significant. Some species have none, the nasals and internasals being in contact with the rostral.

Subnasal.—A relatively large scale immediately below the nasal, in contact with the anterior canthal and loreal. It is regularly absent in some species.

Canthals.—One or two scales on the canthus rostralis. The number is of taxonomic importance. In some species the anterior is frequently forced above the canthal ridge by contact of the subnasal and posterior canthal.

Loreal.—A small scale below the canthals, in contact anteriorly with the subnasal and posteriorly with the preocular. It may rarely be divided into two or three scales. The first canthal occasionally separates the loreal from the subnasal and contacts the rows of scales above the supralabials.

Preocular.—A small scale, with a heavy keel near its upper posterior edge, split off from the anterior end of the subocular. The preocular is, in some species, divided longitudinally.

Subocular.—A large, curved, elongate scale immediately below the eye, with a heavy keel near its upper edge.

Postoculars.—Variable, usually two. They follow the subocular, curving posteriorly and upward at the edge of the orbit, and are usually distinguished from the adjacent temporal scales by being keeled and somewhat larger.

Lorilabials.—The small scales above the supralabials. They are in one or two rows; if the latter, they may be reduced to one at some point below the subocular. One of these rows continues about the snout as the postrostrals in most species.

Supralabials.—The scales on the upper labial border, excluding the scale at the tip of the snout. The scales of this series are smooth and as a rule nonimbricate, but in certain species are rather strongly imbricate and may be rugose or keeled.

Infralabials.—The scales on the lower labial border, excluding the scale at the mandibular symphysis. The scales of this series are similar in character to the supralabials.

Mental.—A median anterior pentagonal or triangular scale bordering the lip.

Postmentals.—A series of enlarged scales on each side posterior to the mental. The scales are paired; those of the anterior pair are separated from each other by a varying number of scales. The number of postmentals is irregular and of little taxonomic significance.

Labiomentals.—Usually two, sometimes one, series of scales on each side between the postmentals and infralabials. In some species the anterior scale of the outer row may contact the mental, and this condition is of some taxonomic significance. When the anterior scale of the outer row is separated from the mental, it is only by narrow contact of the first infralabial with the first postmental. The inner row of labiomentals, when present, never extends as far forward as the outer row, and the position at which it terminates, in relation to the infralabials, is of considerable taxonomic significance.

Gular scales.—The modifications such as carination, mucronation, and denticulation of these scales, as well as their relative size, are important.

Auricular lobules.—These are the scales on the anterior border of the ear. Their number and relative size are important in some species.

Temporals.—The modifications and relative size of these scales are important.

Lateral nuchal pocket.—A dermal pocket between the arm and the ear, present in all species of *Sceloporus.* The lining of the pocket is without scales or only with small, granular scales. The character of the scales surmounting the overlapping fold of skin is of considerable importance.

Gular fold.—A complete, structural gular fold (i.e. of granular scales) does not occur in any species of the genus. In a few, however, there is an indication of it in front of the insertion of the foreleg; this rudiment is not to be confused with the lateral nuchal pocket, which is situated anteriorly.

Dorsal scales.—The modifications and relative size of the scales of the back are of great importance. They are counted in as nearly a straight line as possible, near the mid-dorsal line, from the interparietal to a line between the posterior margins of the hind legs.

Lateral scales.—Size and character of the scales on the sides are to be noted; in some species, particularly of the *poinsettii* group, the median lateral scales are distinctly larger than the median dorsal scales, while in most species they are smaller. The scale count around the body is taken at the middle.

Ventral scales.—The modifications of the scales of the ventral surface are to be noted. They are counted in a straight line near (not on) mid-venter, from a line between anterior margin of shoulders to anus.

Preanals.—Scales of the preanal region posterior to the femoral pore series (projected). In some groups these are keeled in females. In a number of species of the *poinsettii* group they are modified in such a manner as to appear pore-like.

Scales of the foreleg.—Relative sizes and modifications are noted. The number of lamellae under the fingers is of minor importance.

Scales of the hind leg.—Size and modifications noted. The number of subdigital lamellae is of greater importance.

Femoral pores.—A longitudinal series of pits along the postero-ventral border of the thighs. The number of pores in each series, or in the two together, is of much importance. They are always present in *Sceloporus*, although in *horridus oligoporus* they may be as few as two on each leg.

Caudal scales.—Size and character are important.

Postanals.—Two enlarged, smooth scales immediately posterior to the anus in males. They are present in most groups, but absent or erratic in others.

Postfemoral dermal pocket.—A small, very distinct, obliquely situated pocket on the base of the tail near the posterior margin of the insertion of the hind leg (sometimes difficult to distinguish in the very young). These pockets occur in all members of the *variabilis* group, and in *maculosus* and *gadoviae.*

Coloration.—Certain color characteristics are distinctive of groups. The most important single characteristic of the members of the *poinsettii* group is the presence of a black, light-bordered collar about the neck. The light borders may be incomplete (most nearly incomplete in a phase of *j. jarrovii* and in *f. melanogaster*), but never absent. Certain species of related groups (*grammicus, formosus, spinosus*) may have black nuchal collars, but these differ in lacking the light borders.

In most species, the males have distinctive lateral belly patches blue or pink in color, usually dark or black bordered; the borders may expand and cover the entire belly. Females of a few forms (notably *variabilis smithi*) have similar patches. Both males and females of some species are more or less unicolor below; it is of interest that in most of these the males have no enlarged postanals, and that it is the female which carries the most conspicuous secondary sex character (keeled preanals).

Measurements.—The distance from snout to occiput is measured from the posterior edge of the interparietal to the end of the snout, in a plane parallel with the edge of the mouth. The snout to ear

measurement is taken from the posterior border of the ear, in a line parallel to the median vertical axis of the head. The hind leg is measured along its posterior border, from the insertion of the leg to the tip of the fourth toe, excluding the claw. The fourth toe is measured from the base of the fifth, and does not include the claw.

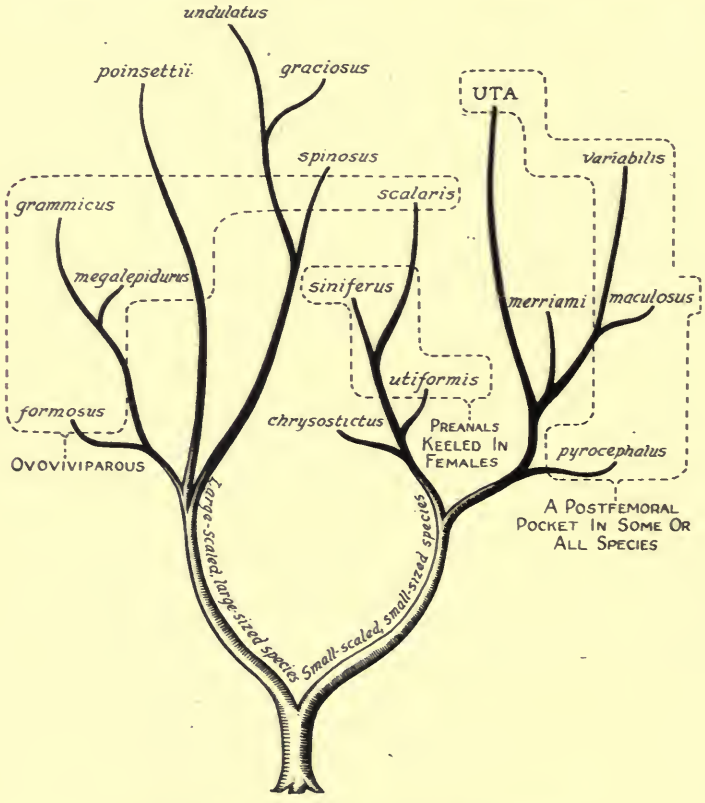

FIG. 3. Phylogeny of the groups of *Sceloporus*.

The tibia is measured along its anterior border, flexing the tibia back against the femur, holding the metatarsus at right angles to the tibia, and measuring from the inner angle of the tibiometatarsal joint to the proximal end of the tibia.

DEFINITION OF THE GENUS

Sceloporus Wiegmann.

Sceloporus Wiegmann, Isis, **21**, p. 369, 1828 (type, *Sceloporus torquatus* Wiegmann=*ferrariperezi*).

The definition of the genus *Sceloporus* offers little difficulty. Within the family Iguanidae it belongs to the typically North American series of genera with femoral pores; its depressed body, imbricate and keeled dorsal scales, enlarged occipital shield, keeled digital lamellae, and distinct tympanum, in combination with the absence of abdominal ribs, collar, gular pouch, pterygoid teeth, and dorsal crest, distinguish it from the other genera of the family. *Uta*, with a collar, is perhaps directly allied to *Sceloporus* and presumably derived from one of its branches. *Sator*, with a compressed body, appears to be another direct ally; otherwise *Sceloporus* is well isolated from all other iguanid genera. Its center of abundance and diversification is plainly the Mexican plateau and its escarpments.

While the depressed body in iguanid lizards is ordinarily associated with terrestrial habits, the species of *Sceloporus* are markedly arboricole and petricole. Habitat limitation, however, is not extreme in most species of the genus; and wide distribution and great variability are seen to be correlated with adaptability, or more exactly, "euryoky."

ARRANGEMENT OF THE SPECIES IN GROUPS

Of the 127 names proposed in the genus, I consider 95 valid. These have been segregated into 15 groups of approximately equivalent morphological value. These are necessarily very unequal in number of species, three being monotypic, while the remaining 12 include from two to 21 forms. The interrelations of these groups are shown on the accompanying phylogenetic tree (fig. 3). The groups are as follows:

Group FORMOSUS

asper
formosus formosus
formosus malachiticus
formosus smaragdinus
salvini

Group SPINOSUS

acanthinus
clarkii clarkii
clarkii boulengeri
edwardtaylori
horridus horridus
horridus oligoporus
horridus albiventris
lunaei
lundelli lundelli
lundelli gaigeae
magister magister
magister lineatulus
magister monserratensis
magister rufidorsum
magister zosteromus
melanorhinus
olivaceus
orcutti orcutti
orcutti licki
spinosus spinosus
spinosus caeruleopunctatus

Group UNDULATUS

becki
cautus
occidentalis occidentalis
occidentalis biseriatus
occidentalis taylori
undulatus undulatus
undulatus consobrinus
undulatus elongatus
undulatus floridanus
undulatus garmani
undulatus tristichus
undulatus virgatus
woodi

Group GRACIOSUS

graciosus graciosus	*graciosus gracilis*	*graciosus vandenburgianus*

Group GRAMMICUS

grammicus	*microlepidotus microlepidotus* *microlepidotus disparilis*	*heterolepis*

Group MEGALEPIDURUS

megalepidurus
piclus

Group POINSETTII

bulleri	*ferrariperezi binocularis*	*mucronatus omiltemanus*
cyanogenys	*jarrovii jarrovii*	*ornatus ornatus*
dugesii dugesii	*jarrovii immucronatus*	*ornatus caeruleus*
dugesii intermedius	*jarrovii minor*	*poinsettii*
ferrariperezi ferrariperezi	*lineolateralis*	*serrifer serrifer*
ferrariperezi melanogaster	*mucronatus mucronatus*	*serrifer plioporus*

Group VARIABILIS

couchii	*parvus scutulatus*	*variabilis marmoratus*
cozumelae	*teapensis*	*variabilis olloporus*
parvus parvus	*variabilis variabilis*	*variabilis smithi*

Group MERRIAMI

merriami merriami
merriami annulatus

Group MACULOSUS

maculosus

Group CHRYSOSTICTUS

chrysostictus

Group SINIFERUS

carinatus	*ochoterenae*	*siniferus*
cupreus		*squamosus*

Group UTIFORMIS

utiformis

Group SCALARIS

aeneus aeneus	*goldmani*	*scalaris slevini*
aeneus bicanthalis	*jalapae*	*scalaris unicanthalis*
	scalaris scalaris	

Group PYROCEPHALUS

gadoviae	*nelsoni*	*pyrocephalus*

KEY TO THE GROUPS OF SCELOPORUS

1.—Postfemoral dermal pocket present.....2
Postfemoral dermal pocket absent.....4

2.—Postrostral scales absent; nasals and internasals in contact with rostral. *maculosus* (p. 290)
Postrostral scales present; internasals and nasals separated from rostral....3

3.—Tail strongly compressed in males, rounded and light pink in females; femoral pores 24 or more on each side.....*pyrocephalus* (p. 361)
Tail rounded in both sexes, not pink in females; femoral pores 20 or less. *variabilis* (p. 236)

4.—Lateral body scales not imbricate....5
Lateral body scales imbricate....6

5.—Preanal scales keeled in females; males with poorly developed postanals; no distinct belly patches in males; tail over twice length of body. *utiformis* (p. 324)
Preanal scales smooth in females; males with well-developed postanals; lateral belly patches distinct in males; tail less than twice length of body. *merriami* (p. 284)

6.—No postrostrals; nasals and internasals in contact with rostral....7
Postrostrals present; nasal and internasals separated from rostral....8

7.—Dorsal scales 50 or more; femoral pores 17 or more; preanals smooth in females....*scalaris* (p. 330)
Dorsal scales 46 or less; femoral pores 16 or less; preanals keeled in females. *siniferus* (p. 300)

8.—Ventral scales, at least laterally, pointed, not notched; preanal scales keeled in females; no lateral belly markings in males; femoral pore series widely separated medially; two postrostrals....*siniferus* (p. 300)
Ventral scales notched or, if pointed, femoral pore series closely approximated medially (separated by four scales or less); preanal scales smooth in females....9

9.—Males uniform white below; anterior section of frontal longitudinally divided; femoral pore series widely separated medially....*chrysostictus* (p. 294)
Males with lateral belly patches distinct or, if not, anterior section of frontal entire....10

10.—Femoral pore series closely approximated medially; two postrostrals; lateral scale rows parallel or nearly so; scales on posterior surface of thigh granular; small species....*scalaris* (p. 330)
Femoral pore series widely separated medially or, if closely approximated, scales on posterior surface of thigh not granular; lateral scale rows strongly divergent; typically four postrostrals, sometimes three, rarely two....11

11.—Scales on posterior surface of thigh granular....12
Scales on posterior surface of thigh not granular....15

12.—Dorsal scales highly irregular in size....*grammicus* (p. 177)
Dorsal scales subequal in size....13

13.—Lateral nuchal scales much smaller than and well differentiated from dorsal nuchal scales; scales of lateral row of dorsal nuchals enlarged, strongly keeled and mucronate....*grammicus* (p. 177)
Lateral nuchal scales not well differentiated from dorsal nuchal scales....14

14.—Throat light blue, barred or mottled with white; lateral belly patches confluent medially; preanal scales large, about seven in a row from a line between femoral pore series to anus....*grammicus* (p. 177)
Throat not as described or, if so, lateral belly patches not confluent medially and preanal scales smaller....15

15.—Scales on posterior surface of thigh granular; femoral pore series widely separated medially, the folds defining the preanal area passing between the femoral pore series; throat mottled with blue and white, never with a distinct, blue spot medially or on either side posteriorly..*graciosus* (p. 176)
Scales on posterior surface of thigh not granular or, if so, the femoral pore series more closely approximated medially, the folds defining the preanal area not or barely passing between the femoral pore series....16

16.—Dorsal, ventral, and lateral scales subequal in size; small species. *megalepidurus* (p. 199)
Dorsal, ventral, and lateral scales distinctly differing in size; large or small species....17

17.—A distinct, dark, light-bordered nuchal collar.....*poinsettii* (p. 209)
No distinct, dark, light-bordered nuchal collar.....18

18.—Gular region mottled, not barred nor with a median or two lateral blue spots posteriorly.....*poinsettii* (p. 209)
Gular region not mottled.....19

19.—Gular region barred in males and lacking a median posterior dark blue or black spot.....*spinosus* (p. 59)
Gular region not barred; or, if barred, with a median posterior dark blue or black spot.....20

20.—Gular region barred in males, with a median posterior dark blue or black spot. *undulatus* (p. 172)
Gular region not barred.....21

21.—Supraoculars large, separated from superciliaries by no more than one complete and one incomplete row of small scales; and one or more of the posterior supraoculars in contact with median head scales..*spinosus* (p. 59)
Supraoculars large or small; if any of the posterior supraoculars are in contact with median head scales, the supraoculars are separated from superciliaries by three or more complete or incomplete rows of small scales...22

22.—Males lacking lateral belly patches.....*undulatus* (p. 172)
Males with lateral belly patches.....23

23.—A pair of dark blue or black spots on posterior part of gular region. *undulatus* (p. 172)
No pair of dark spots on posterior part of gular region.....24

24.—Three or more rows of small scales between supraoculars and superciliaries; or, if two, the scales of the inner row considerably larger than those of the outer row.....25
One complete and one incomplete row of small, subequal scales between supraoculars and superciliaries.....27

25.—One canthal, or, if two, the first forced above canthal ridge..*formosus* (p. 32)
Two canthals, the first not forced above canthal ridge.....26

26.—A broad, black nuchal collar complete about neck dorsally, or anterior section of frontal longitudinally divided.....*formosus* (p. 32)
Neither true.....*undulatus* (p. 172)

27.—Frontal ridges present.....*formosus* (p. 32)
Frontal ridges absent.....*spinosus* (p. 59)

THE FORMOSUS GROUP[1]

Ten species have been described within the *formosus* group. These are *asper* Boulenger, *formosus* Wiegmann, *irazuensis* Günther, *malachiticus* Cope, *obscurus* Van Denburgh, *salvini* Günther, *schmidti* Jones, *smaragdinus* Bocourt, *taeniocnemis* Cope, and *viviparus* Cope. Of these, I recognize five species and subspecies: *asper*, *formosus formosus*, *f. malachiticus*, *f. smaragdinus*, and *salvini*.

The characters which, in their combination, distinguish the group from others of the genus are: moderately large size (maximum

[1] Approximately 587 specimens examined.

snout-vent measurement of largest species, 95 mm.; of smallest, 81 mm.); scales on posterior surface of thigh not granular, not less than half the size of preanal scales; supraoculars small, entire or in two rows; posterior supraoculars not regularly in contact with median head scales; a tendency toward development of frontal ridges;

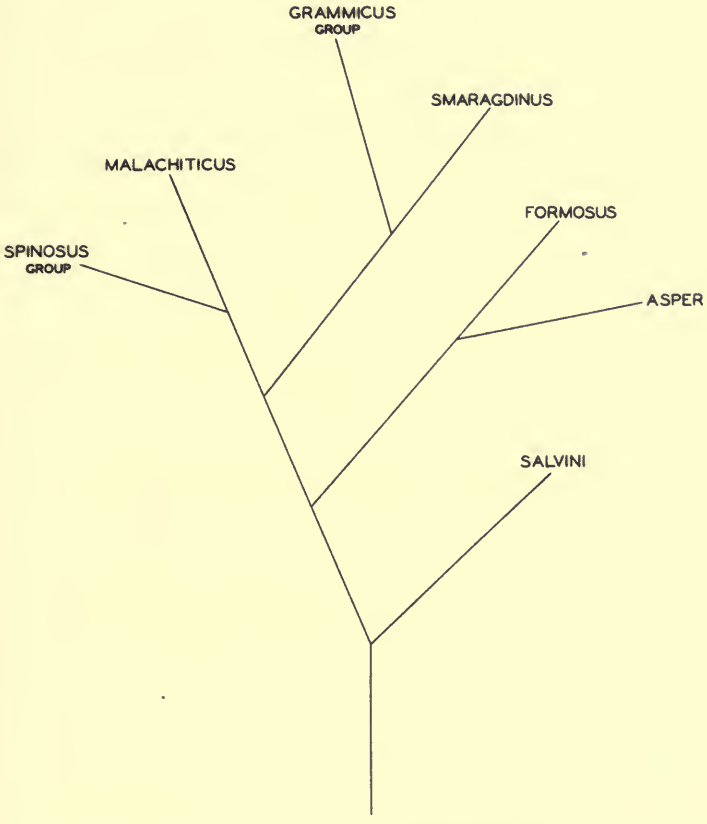

FIG. 4. Phylogeny of the *formosus* group.

throat not barred, but generally suffused with blue or orange; sides of belly blue in males, usually dark-bordered; a black shoulder spot present, sometimes extending dorsally to form a nuchal collar; and nuchal collar, if present, not light-bordered.

The phylogeny of this group is interesting. It is more primitive than the *microlepidotus* and *spinosus* groups, which are, in turn, more primitive than the *megalepidurus* and *poinsettii* groups, respectively.

S. salvini is a derivative which has no direct relationship with any other species of its group, or with any other group of *Sceloporus*. It is therefore thought to have been developed early in the phylogeny of its group. *S. f. malachiticus* was perhaps developed at more or less the same time and early gave rise to *f. formosus*, to which *asper* seems most closely related. *S. f. malachiticus* later developed another subspecies, *f. smaragdinus*.

The species of the *formosus* group are largely arboreal, are in general confined to a high altitude (descending to a rather low elevation in Costa Rica), and are, so far as known, ovoviviparous. The subspecies of *formosus* are known to be ovoviviparous; there are no observations for *salvini* and *asper*.

KEY TO THE SPECIES AND SUBSPECIES OF THE FORMOSUS GROUP

1.—A complete dorsal nuchal collar three or four scales wide in both sexes (sometimes broken narrowly in mid-dorsal line); lateral frontonasals separated from median frontonasal; two rows of supraoculars; dorsal scales 39 to 44. *salvini* (p. 55)

No complete nuchal collar; lateral frontonasals in contact with median frontonasal (except extreme northern specimens of *f. smaragdinus*).....2

2.—Ventral scales one-fourth size of dorsal scales; largest lateral scales two-thirds size of dorsal scales; anterior section of frontal usually longitudinally divided; sides of belly blue in males, not dark-bordered; gular region immaculate in males; two canthals; dorsal scales 29 to 35, strongly keeled. *asper* (p. 51)

Ventral scales at least one-half size of dorsal scales; largest lateral scales at least three-fourths size of dorsal scales; anterior section of frontal rarely longitudinally divided; sides of belly blue in males, dark-bordered; gular region blue or orange in males.....3

3.—Dorsal scales usually 39 or more.....*f. smaragdinus* (p. 41)

Dorsal scales usually 38 or less.....4

4.—One canthal or, if two, the first usually forced above canthal ridge; males usually with a light line down the center of each dorsal scale row; frontal usually separated from interparietal.....*f. malachiticus* (p. 46)

Usually two canthals, the first usually not forced above canthal ridge; males usually lacking a light line down the center of each dorsal scale row; frontal usually in contact with interparietal.....*f. formosus* (p. 34)

Sceloporus formosus formosus Wiegmann.

Sceloporus formosus Wiegmann, Herp. Mex., p. 50, pl. 7, fig. 2, 1834; Fitzinger, Syst. Rept., p. 75, 1843; Müller, Reisen in Mexiko, p. 601, 1865; Bocourt, Ann. Sci. Nat., Zool., (5), **17**, No. 10, p. 1, 1873; idem, Miss. Sci. Mex., Zool., **3**, sec. 1, p. 182, pl. 18, figs. 3, 3 *a–c*, 1874; Dugès, Naturaleza, **4**, p. 30, 1877; Cope, Proc. Amer. Phil. Soc., **18**, p. 265, 1879; Sumichrast, Naturaleza, **6**, p. 38, 1882; Garman, Bull. Essex Inst., **16**, p. 17, 1884; Dugès, Naturaleza, (2), **1**, p. 114, 1888; Stejneger, N. Amer. Fauna, **7**, p. 178, 1893; Gadow, Proc. Zool. Soc. Lond., **2**, pp. 194, 214, 231–232, 1905; idem, Through Southern Mexico, pp. 57, 270, 1908; idem, Zool. Jahrb. Syst., **29**, p. 706, 1910; Ruthven, Rept. Mich. Acad. Sci., **14**, p. 231, 1912; Gadow, Jorullo, p. 95, 1930.

Tropidolepis formosus Duméril and Bibron, Erp. Gén., **4**, pp. 303–304, 1837; Duméril, Cat. Méth., p. 77, 1851; Gray, Cat. Liz. Brit. Mus., p. 209, 1845; Lichtenstein, Nomen. Rept. Amph., p. 9, 1856; Jan, Cenni Rept. Mus. Milano, p. 39, 1857; Sumichrast, Ann. Mag. Nat. Hist., (3), **13**, p. 507, 1864; idem, Bibl. Univ. Rev. Suisse, **19**, p. 61, 1864; idem, Naturaleza, **1**, p. 206, 1870 (*Tropidolepsis* f.); Dugès, Naturaleza, **1**, p. 143, 1870; Westphal-Castelnau, Congr. Scient. France, **35**, p. 285, 1872.

Sceloporus malachiticus Sumichrast, Naturaleza, **6**, p. 38, 1882 (part).

Sceloporus viviparus Cope, Proc. Amer. Phil. Soc., **22**, p. 398, 1885—Mirador, Vera Cruz (type, USNM 25073, collected by Sartorius); idem, Bull. U. S. Nat. Mus., **32**, p. 36, 1887; Günther, Biol. Cent.-Amer., Rept. Batr., pp. 64–65, 1890; Cope, Ann. Rept. U. S. Nat. Mus., **1898**, p. 336, 1900; Dunn, Proc. Acad. Nat. Sci. Phila., **88**, p. 474, 1936; Smith, Proc. Biol. Soc. Wash., **49**, p. 95, 1936.

Sceloporus acanthinus Günther, Biol. Cent.-Amer., Rept. Batr., pp. 65–66, 1890 (part); Dugès, Naturaleza, (2), **2**, p. 480, 1896; Gadow, Proc. Zool. Soc. Lond., **2**, pp. 194, 214, 231, 232, 1905; idem, Through Southern Mexico, pp. 270, 513, 1908; idem, Zool. Jahrb., Syst., **29**, p. 706, 1910; Ahl, Zool. Anz., **106**, p. 184, 1934.

Sceloporus formosus formosus Wettstein, Sitzber. Akad. Wiss. Wien, Math. Nat. Kl., **143**, Abt. 1, p. 25, 1934.

Type locality.—Mexico.

Distribution.—Mountains of Guerrero and Oaxaca south of the Balsas River; also central western Vera Cruz (fig. 5).

Diagnosis.—A *Sceloporus* of moderate size, maximum snout-vent measurement 88 mm.; a pair of black shoulder spots, each with a narrow dorsal extension which fails to meet its fellow by five to six scale rows; dorsal scales average 34; ventral scales average 46; scales around body average 39; femoral pores average 16; median frontonasal in contact with lateral frontonasals; internasal area covered with relatively large scales, usually arranged in one, two, or three pairs; supraoculars small, in one or two rows; usually two, rarely one, canthal, the first usually not forced above canthal ridge; frontal usually in contact with interparietal; usually one loreal; throat bluish or orange or both; sides of belly blue, black-bordered, the borders sometimes fusing and the black extending over chest and middle of abdomen; nuchal collar complete ventrally in males; latter usually without a light line down the center of each dorsal scale row (present only in Guerrero specimens).

Description.[1]—Head scales smooth, more or less pitted, convex; frontal ridges very prominent, enclosing a deep depression; interparietal pentagonal, its sides somewhat divergent, two or two and

[1] Based chiefly on USNM 46837, male, La Parada, Oaxaca.

one-half times as large as either parietal; one large parietal, frequently followed posteriorly by a small, elongate scale which might be considered a second parietal; usually one, occasionally two frontoparietals on each side, usually separated medially by contact of frontal and interparietal; frontal typically divided; five or six supraoculars; usually one to four small scales in a second, outer row of supraoculars; one to three supraoculars of the inner row may contact median head scales; one complete and another incomplete row of

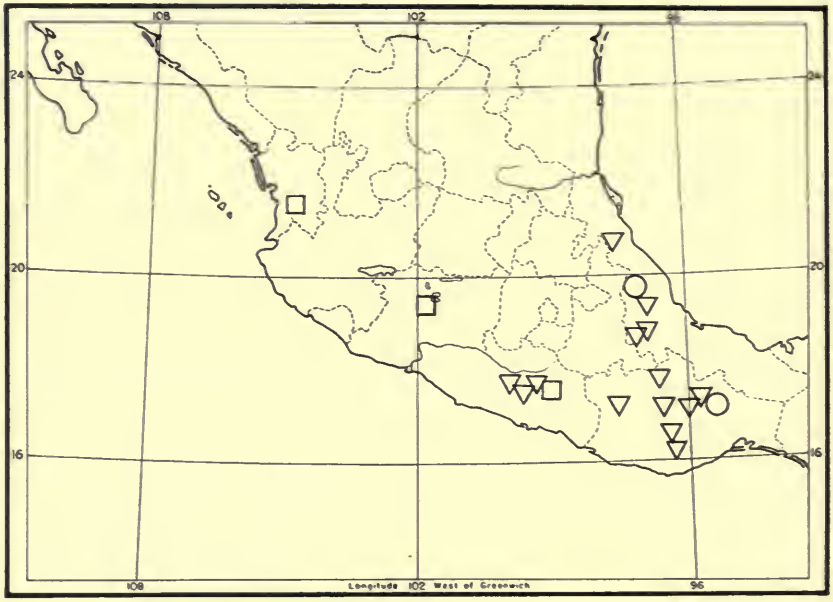

FIG. 5. Distribution of *Sceloporus asper*, □; *S. salvini*, ○; *S. formosus formosus*, ▽.

small scales between supraoculars and superciliaries; usually six, rarely five, superciliaries, five (occasionally four) visible from above; prefrontals usually in contact medially, frequently separated by an azygous scale or by contact of frontal and median frontonasal; frontonasals typical; one or two pairs of internasals, the scales occasionally irregular; four, rarely two, postrostrals; subnasal large; usually two canthals, rarely one; when two canthals are present, the first is seldom above the canthal ridge (second canthal in contact with subnasal); preocular rarely divided; usually one loreal, rarely two or three; two small postoculars; two rows of lorilabials, usually reduced to one row below subocular by contact of one or more

scales with both subocular and supralabials; three and one-half supralabials and five infralabials to a point below middle of eye.

Mental pentagonal, with a labial border slightly more than half that of rostral; about four pairs of postmentals, the scales of the anterior pair in contact medially; outer row of labiomental scales separated anteriorly from mental by partial contact of first postmental and first infralabial; gular scales immediately below ear keeled, mucronate, denticulate; other gular scales notched, the anterior scales with a single apical notch, the posterior with two apical notches; scales in gular fold area with two apical notches.

Auricular lobules smooth, short, about four or five in number, more or less subequal in size, the upper and lower scales pointed, the median scales rounded, the largest extending about half the distance across ear opening, subequal in size to preceding scales; temporal scales weakly keeled, weakly mucronate, denticulate, decreasing in size anteriorly, the largest scales somewhat smaller than scales between ear and lateral nuchal pocket; latter scales strongly keeled, mucronate and denticulate, larger than scales between nuchal pocket and arm; the latter scales weakly keeled, strongly mucronate and denticulate.

Dorsal scales 31 to 37, keeled, rather strongly mucronate, denticulate, in more or less parallel rows; lateral scales subequal in size to dorsal scales, similar in general character, in oblique rows; ventral scales smooth, notched or rounded, those in midventral line somewhat smaller than lateral scales; preanal and interfemoral scales subequal in size to middle abdominal scales; scales around body 34 to 43; ventral scales 41 to 54.

Dorsal scales on foreleg strongly keeled, strongly mucronate, weakly denticulate, those on upper foreleg about two-thirds size of dorsals on body and somewhat larger than dorsal scales of lower foreleg; ventral scales of lower foreleg keeled, mucronate, denticulate, very slightly smaller than dorsal scales of same member; scales on anterior surface of lower foreleg smooth, somewhat larger than other scales of same member; ventral scales of upper foreleg smooth medially, notched, about one-third size of ventral scales of lower foreleg; lamellar formula for fingers 10–14–18–17–13 (occasionally 19–18 on the third and fourth).

Dorsal scales of hind leg strongly keeled, strongly mucronate, weakly denticulate, more or less subequal in size, about two-thirds to three-fourths size of dorsal body scales; scales on ventral surfaces of thigh smooth, rounded, or notched, becoming smaller toward

femoral pore series, larger toward anterior face of thigh; scales on posterior surface of thigh keeled, mucronate, about one-half size of preanal scales; ventral scales on shank smooth or very faintly keeled, notched or denticulate, subequal in size to dorsal scales of same member; femoral pores 13 to 20; lamellar formula for toes 9–14–19–21–16 (9–13–18–21–15).

Dorsal caudal scales very strongly keeled, strongly mucronate, weakly denticulate, somewhat larger than dorsal scales on body; subcaudals pointed and smooth near base of tail, becoming keeled and mucronate distally; enlarged postanals present in males; no postfemoral dermal pocket.

Color.—Males with dorsal surfaces iridescent, light olive-green or blue-olive, head drab; a prominent black spot on shoulder, widely separated medially (five or six scale rows), uniting across throat; a somewhat broader band of cobalt blue on ventral surface anterior to black throat band; anterior to this a broad area of light orange (in some specimens the orange is absent, and blue covers the entire area anterior to the black gular collar); sides of belly iridescent, pearl blue, bordered medially by a blue or black band, which band expands posteriorly in the region of the groin; chest and middle of belly white, or, in large males, strongly suffused with black, confluent with black gular collar; ventral surfaces of tail white, suffused more or less with pale blue in large males.

In females the dorsal color is brown or brown-olive; the black marks on the shoulders are narrower than in males and extend farther dorsally (separated by two or three scale rows); two parallel dark lines, sometimes broken and usually indistinct, pass from the upper edge of the scapular mark onto the tail; on the sides of body and on the neck are scattered indistinct dark spots; the belly is immaculate, suffused slightly with blue in some specimens.

Variation.—The variation of the head scales in 51 specimens is as follows: parietals one or two (78 counts: 1, seven; 2, seventy-one); frontoparietals one or two on each side (1, eighty-five; 2, seventeen); frontal contacts interparietal in 49, separated by an azygous scale in two; frontal entire in one, the posterior section divided into three in one (39 examined); superciliaries five or six (5, four; 6, seventy-four); supraoculars in one or two rows, irregular; one or more supraoculars in contact with median head scales in 11 specimens; prefrontals in contact medially in 27, separated by an azygous scale in 11, by contact of frontal and median frontonasal in 13; frontonasals normal in all; internasals rather irregular, usually in one or

two pairs; subnasal present in all; one canthal in five (fused with subnasal in two of these), two in 97; first canthal forced above canthal ridge by contact of second canthal and subnasal in 15; preocular divided in 6, entire in 96; one to three loreals (1, sixty-seven; 2, eight; 3, three); postrostrals two or four (2, two; 4, thirty-seven); two rows of lorilabials in all, reduced to one row below subocular by contact of one or more scales with both subocular and supralabials on one side in 3, on both sides in 35.

Dorsal scales 31 to 37, average 34 (52 counts: 31, two; 32, eight; 33, eleven; 34, ten; 35, eleven; 36, six; 37, four); ventral scales 39 to 54, average 46.6 (51 counts: 39, one; 41, three; 42, four; 43, two; 44, five; 45, five; 46, four; 47, eight; 48, two; 49, four; 50, four; 51, four; 52, three; 53, one; 54, one); scales around body 34 to 43, average 39.3 (51 counts: 34, two; 35, one; 36, two; 37, five; 38, four; 39, nine; 40, ten; 41, eight; 42, five; 43, five). Femoral pores 13 to 20, average 15.9 (98 counts: 13, one; 14, sixteen; 15, twenty; 16, thirty-one; 17, twenty; 18, seven; 19, two; 20, one).

Geographic variation.—Specimens from Guerrero (Chilpancingo, Omilteme) differ from the Oaxacan and Vera Cruzian *f. formosus* as follows: males with a light blue line down each dorsal scale row; large, well-defined, white or pinkish spots on the head in both sexes—one on each parietal, on the interparietal, posterior section of frontal, both prefrontals, lateral frontonasals, posterior pair of internasals, and on several of the supraoculars and superciliaries.

One male specimen from Omilteme (MCZ) differs from others from the same locality in lacking the light spots on the head and the light lines on the body, and in having much smaller scales on the posterior surface of the thigh, and smaller dorsal scales (40 from occiput to base of tail).

A male specimen (AMNH 58261) from Tlaxiaco, Oaxaca, while typical in scutellation, shows a rather aberrant coloration, at least in that sex at its size (67.4 mm. snout-vent). Its coloration is as follows (from the freshly preserved specimen): a light brownish gray, median dorsal band one and two half scale rows wide, extending from nape onto tail; a bluish green band on either side of this, two and two half scale rows wide at middle of body, narrower anteriorly and posteriorly; latter bands end at base of tail; a dorsolateral light band one scale row wide extending from nape onto tail; sides of body bluish green, with a faintly visible, whitish lateral stripe; sides of chest, gular fold region, and shoulder area black; shoulder spot bordered posteriorly by a narrow light line yellow medially and pale

bluish at extremities; a light, longitudinal line on posterior surface of thigh, bordered above and below by a narrow dark line; toes, hands, and fingers darker than other parts of limbs; limbs not barred or otherwise marked, except thigh with a few dark spots on anterior surface; posterior part of throat dark blue, anterior part apparently yellowish or light orange; sides of abdomen light cerulean blue, bordered medially by dark blue, followed medially by a narrow area of black; a small black spot in groin; a whitish median abdominal band three to four scales wide, and another across chest between axillae two scales wide.

Remarks.—A number of authors, probably influenced by Cope, have incorrectly interpreted Wiegmann's *Sceloporus formosus*. Cope thought the name applied to a broad-collared form, of which he had several specimens from Jalapa. He therefore described the common Mexican species as *viviparus*, a form actually synonymous with Wiegmann's *formosus*. The form which Cope thought was *formosus* was actually not described until 1890, when Günther named it *salvini*, based upon specimens from Guatemala, southern Mexico, and Jalapa. As the Guatemalan cotypes probably are the same as Bocourt's *smaragdinus*, and the southern Mexico cotypes of doubtful identity, I designate the single Jalapa cotype (specimen *o*, male, in Boulenger's table, 1897, p. 503) as the lectotype of *salvini*, thereby making the name available for the species redescribed below under that name.

For determination of the identity of Wiegmann's *formosus* I have relied upon Bocourt's redescription and figures, which were based upon Wiegmann's type (1874). In the figure, two characters of importance are to be noted: there are two pairs of internasals, and the median frontonasal is in contact with the lateral frontonasals. The condition of these scales is similar in the types of *viviparus*, except that the internasals are not always in two pairs; in *salvini* the internasal area is quite different, covered by a relatively large number of highly irregular, small scales; the median frontonasal is always separated from the lateral frontonasals. In his description of *formosus* Bocourt states that each of the shoulder spots has a narrow dorsal extension toward the middle of the neck, failing to meet the opposite mark. The spots are similar in the supposed *viviparus*, while in *salvini* a broad nuchal collar is present, complete or abruptly broken medially by a narrow area about one scale row wide.

Habits and habitat.—The species is largely confined to high elevations. Gadow (1910) states that it occurs at elevations from 500

feet to 9,000 feet. I very much doubt that it descends as low as 500 feet. It seems to be entirely arboreal, and shows a preference for pine forests, avoiding tropical or subtropical deciduous forests and areas covered by the smaller cedar trees. In areas in which I have observed the species, individuals are seen during a short period during the middle of the day (from about 10:00 A.M. to 4:00 P.M.), and numerous, cloudy days pass which are too cool to permit their emergence. In life the males are most brilliantly and beautifully colored, and are easily discerned at a distance. Females are more difficult to see, being darker, but they are much more easily captured. Females may be caught by hand by carefully stalking them; males cannot, so far as I observed.

As recorded by numerous authors (first by Sumichrast, 1864), *f. formosus* is ovoviviparous.

Locality records.—VERA CRUZ: Xuchil (FMNH 1521[12]); 1½–2 mi. W of Acultzingo (EHT 8672–7); Orizaba (USNM 30209–12, 64670); Mirador (USNM 25073). OAXACA: Tlaxiaco, NW of Oaxaca (AMNH 58261); Cerro de San Luis, 15 mi. N of Oaxaca (EHT 8661–71); Cerro de San Felipe (USNM 47387); Tehuantepec (USNM 30128); Reyes (USNM 47393–4, 47368); Mt. Zempoaltepec (USNM 47406–11); Mts. W of Oaxaca (USNM 47378–9); Totontepec (USNM 46675, 46677); La Parada (USNM 46837); San Pedro Alta (AMNH 18375–89); San Pedro, San Miguel, San José and valley of Miahuatlan (AMNH 18706–19). GUERRERO: Omilteme (MCZ 28655, and 5 without number); Chilpancingo (MCZ 33879); Xochitempa, near Chilapa (Ahl, 1934).

Gadow (1905) records the species from the Nevado de Colima, Jalisco; Bocourt (1874) records it from "Colima." I doubt these records.

Sceloporus formosus smaragdinus Bocourt.[1]

Sceloporus smaragdinus Bocourt, Ann. Sci. Nat., Zool., (5), **17**, No. 10, p. 1, 1873; idem, Miss. Sci. Mex., Zool., **3**, sec. 1, pp. 186–188, pl. 18, figs. 6, 6*b*, pl. 19, figs. 1, 1*b*, 1874; Günther, Biol. Cent.-Amer., Rept. Batr., pp. 68–69, 1890 (part); Wettstein, Sitzber. Akad. Wiss. Wien., Math.-Nat. Kl., **143**, Abt. 1, p. 25, 1934; Smith, Proc. Biol. Soc. Wash., **49**, p. 95, 1936.

Sceloporus malachiticus Cope, Proc. Amer. Phil. Soc., **22**, p. 397, 1885 (part); idem, Bull. U. S. Nat. Mus., **32**, p. 36, 1887 (part); Müller, Verh. Naturf. Ges. Basel, **7**, p. 712, 1885.

[1] It has been difficult to determine the exact identity of material not seen by me which is referred by other authors to various members of the *formosus* group. Part of the synonymy referred to *acanthinus* may belong under this subspecies.

Sceloporus taeniocnemis Cope, Proc. Amer. Phil. Soc., **22**, p. 399, 1885—Guatemala (type, USNM 24768, collected by H. Hague); idem, Bull. U. S. Nat. Mus., **32**, p. 37, 1887; idem, Ann. Rept. U. S. Nat. Mus., **1898**, p. 336, 1900; Smith, Proc. Biol. Soc. Wash., **49**, p. 95, 1936.

Sceloporus salvini Günther, Biol. Cent.-Amer., Rept. Batr., p. 68, 1890 (part).

Sceloporus formosus Werner, Abh. Bayer. Akad. Wiss., Math.-Phys. Kl., **22**, Abt. 2, p. 344, 1903 (part); Boulenger, Proc. Zool. Soc. Lond., **1897**, pp. 501–503, 1897.

Sceloporus schmidti Jones, Occ. Papers Mus. Zool. Univ. Mich., **186**, pp. 4–7, 1927—Mountain Camp west of San Pedro, Honduras, 4,500 ft. (type lost); Schmidt, Field Mus. Nat. Hist., Zool. Ser., **20**, p. 15, 1933; Smith, Proc. Biol. Soc. Wash., **49**, p. 95, 1936.

Type locality.—Guatemala, in the vicinity of Sololá, Totonicapam, and Quetzaltenango. Paratype USNM 11000.

Distribution.—Plateau of Chiapas, southward and eastward on the plateau of Guatemala, including the Cobán region, to El Salvador, and northward in western Honduras (fig. 6).

Diagnosis.—Similar to *S. formosus malachiticus*, differing in maximum size, size of body scales and in coloration of the male;

FIG. 6. Distribution of the Central American species of the *formosus* group: *Sceloporus formosus smaragdinus*, ○; *S. f. malachiticus*, △.

maximum snout-vent measurement 85 mm.; dorsal scales 38 to 49, average 43; ventral scales 45 to 55, average 50; scales around body 41 to 52, average 48; femoral pores 11 to 18, average 15; frontal seldom separated from interparietal; supraoculars in two irregular rows; one canthal or, if two, the first usually forced above canthal ridge by contact of second canthal and subnasal; loreal very irregular, usually fused with other scales or divided into two or more scales; anterior part of gular region usually orange or red-orange in males; dorsal surfaces of males lined as in *f. malachiticus;* females colored as in the latter; shoulder spots in males with a narrow dorsal extension not reaching the mid-dorsal line.

Color.—In preserved males: greenish blue to blue-olive above; a narrow dark streak down the side of each dorsal scale row; toes and fingers faintly barred; a large black spot in front of each shoulder, the two separated from each other by about nine scale rows; scales cyanine blue (shed); most of scales on head with a light central area; tail faintly barred; two irregular parallel dark lines on posterior surface of thighs, separated from each other by a narrow white line.

Posterior part of throat cyanine blue, fading anteriorly on chin and in labial regions to an olive-blue; a broad black band across gular fold region, continuous with black shoulder spots; chest usually dusky white, sometimes black (largest males); sides of abdomen cyanine blue, sometimes darker; lateral abdominal areas with a black median border, the two borders usually separated by a median longitudinal white band, sometimes nearly meeting medially, or separated by a very dark gray area; groin cyanine blue, never black; ventral surfaces of limbs greenish blue.

A series of about eleven small dark spots on each side of back in females; these spots very irregular in shape, sometimes rounded, sometimes narrow and appearing as short transverse bands; limbs fairly distinctly banded or mottled with black; sides of abdomen with irregular dark marks, tending to be arranged in two rows; shoulder spots sometimes narrowly continuous across neck. Ventral surfaces greenish blue, immaculate.

In both sexes the shoulder spots usually have a light posterior border.

Variation.—Variation in cephalic scutellation of 61 specimens has been recorded. Parietals one to three on each side (1, twenty-seven; 2, ninety-four; 3, one); frontoparietals one or two (1, one hundred and ten; 2, eight); frontal in contact with interparietal in 50, separated

by an azygous scale in none, by contact of frontoparietals in 11; posterior section of frontal transversely divided in one; frontal entire in one; superciliaries five to seven (5, one; 6, one hundred and fourteen; 7, seven); supraoculars in two series, the outer series consisting of one to seven scales (average four); four to six scales in inner row of supraoculars (4, thirty-nine; 5, seventy-three; 6, ten); one or more supraoculars contact median head scales in three; prefrontals in contact medially in 23, separated by an azygous scale in eight, by contact of frontal with median frontonasal in 29; frontonasals irregular in two, normal in others; one to three pairs of internasals, or a combination of these, or somewhat irregular; subnasal present in all; two canthals, the first not forced above canthal ridge on one side in two, on both sides in four; one canthal or, if two, the first forced above canthal ridge by contact of second canthal and subnasal in the remainder; preocular divided on one side in one, on both sides in 12; loreals none to five (0, seven; 1, fifty; 2, thirty-eight; 3, twenty-one; 4, five; 5, one); postrostrals two to four (2, seven; 3, four; 4, forty-nine); two rows of lorilabials, reduced to one row below subocular by contact of one or more scales with both subocular and supralabials on one side in seven, on both sides in twenty-eight.

Dorsal scales 38 to 49, average 42.8 (75 counts: 38, two; 39, two; 40, eight; 41, fourteen; 42, twelve; 43, eight; 44, ten; 45, nine; 46, five; 47, two; 48, one; 49, two); ventral scales 45 to 55, average 50.2 (60 counts: 45, one; 46, two; 47, three; 48, four; 49, thirteen; 50, nine; 51, thirteen; 52, nine; 53, two; 54, three; 55, one); scales around body 41 to 52, average 47.5 (61 counts: 41, one; 43, two; 44, four; 45, four; 46, six; 47, fifteen; 48, seven; 49, ten; 50, eight; 51, two; 52, two). Femoral pores 11 to 18, average 15 (127 counts: 11, one; 12, four; 13, eight; 14, thirty-five; 15, thirty-six; 16, twenty-four; 17, sixteen; 18, three).

Geographic variation.—The available specimens associated with this subspecies are relatively constant in scale characters and coloration. A few specimens deserve comment. Three from Cobán differ from the typical in having 38, 39, and 42 scales from occiput to base of tail. The lowest of these is the lowest observed in the entire series of this subspecies. The femoral pores in two of these specimens are 12–12, 12–12; the ventrals 42, 40; the scales around body 44, 42. All counts are extremely low for *f. smaragdinus.*

Eight specimens from the Volcan Tajumulco, Guatemala, are somewhat different from others of *f. smaragdinus.* These differences

are as follows: dorsal scale count averages slightly higher; femoral pore count averages slightly lower; lesser maximum size (64 mm. snout-vent); males with spots on back like females, and with extensions of the black shoulder patches, which are separated on the neck by only two or three scale rows; nuchal collar two scales wide on sides of neck; belly completely cyanine blue, lighter in middle; black medial border of belly patches not extending into groin or onto chest; throat lighter blue than belly; lower surfaces of limbs pearl blue; tail suffused ventrally with cyanine blue; females tend to have the spots on back narrower, the collar on neck narrower. I believe these specimens demonstrate a phenomenon first observed by Wettstein (1934). This author showed that decrease in maximum size and loss of sexual dichromatism occurs in *f. malachiticus* at high elevations and low average temperatures. The same appears to be true of *f. smaragdinus*.

Remarks.—*S. schmidti* is clearly the same as *f. smaragdinus*, having 42 dorsal scales; *S. taeniocnemis* is definitely identical, having 12 scales to the head length and other characters of *f. smaragdinus*. *S. salvini* Günther is a composite of at least two species, part of the cotypes coming from Guatemala, the others from Jalapa. I consider that his Guatemalan specimens are *f. smaragdinus* (fide data given by Boulenger, 1897).

Habits and habitat.—A number of specimens from Chichivac, Tajumulco, and Cobán, Guatemala, collected in February and March, have young in the abdomen. Slevin states that *f. smaragdinus* is common on rock fences, occasionally is found on trees.

Locality records.—CHIAPAS: Pinobete (USNM 47761–3); Teopisca (USNM 47503).

GUATEMALA: (USNM 24768; ANSP 8485; UMMZ 67690 [4]): Todos Santos (USNM 47521–2); Chancol (USNM 47514–5); San Lucas Volcano (UMMZ 71764[2], 71766[6]; MCZ 28121–50; SDSNH 16308); 5 mi. N of Tecpan, Chimaltenango (CAS 68291–68345); Tecpan (MCZ 28107–11); San Mateo (MCZ 28117–8); Panajachel (MCZ 28112–3); Barrillos (MCZ 28119); La Perla (MCZ 28120); Volcan Agua (FMNH 20290; CAS 68219–35); Cobán (FMNH 20533, 21003; ANSP 11316); Santa Elena, Chimaltenango (FMNH 20221–5, 20238; CAS 68392–3); Chichivac, Chimaltenango (FMNH 20255[34], 20276, 20279[38]); Atitlan (FMNH 2053); Sierra Santa Elena, near Tecpan, 9,500 ft. (FMNH 1925[8]); Volcan Tajumulco, San Marcos, 10,500 to 13,400 ft.

(FMNH 20311–6, 20698–9); San Antonio, Sacatepequez (CAS 68236–90).

HONDURAS: Mts. west of San Pedro (Jones, 1927).

Sceloporus formosus malachiticus Cope.

Sceloporus malachiticus Cope, Proc. Acad. Nat. Sci. Phila., **1864**, p. 178, 1864; idem, **1871**, p. 205, 1871; idem, Jour. Acad. Nat. Sci. Phila., (2), **8**, pp. 95, 127, 1876; Sumichrast, Naturaleza, **6**, p. 38, 1882 (part); Cope, Proc. Amer. Phil. Soc., **22**, p. 397, 1885 (part); idem, Bull. U. S. Nat. Mus., **32**, p. 36, 1887 (part); idem, Ann. Rept. U. S. Nat. Mus., **1898**, p. 335, 1900; Schmidt, Field Mus. Nat. Hist., Zool. Ser., **12**, pp. 193, 196, 1928; Dunn and Emlen, Proc. Acad. Nat. Sci. Phila., **84**, p. 28, 1932; Smith, Proc. Biol. Soc. Wash., **49**, p. 95, 1936.

Sceloporus formosus Boulenger, Cat. Liz. Brit. Mus., **2**, pp. 217, 222–223, 1885 (part); Boettger, Kat. Rept. Senck. Mus., p. 64, 1893 (part); Boulenger, Proc. Zool. Soc. Lond., **1897**, pp. 501–503, fig. 3, 1897 (part).

Sceloporus irazuensis Günther, Biol. Cent.-Amer., Rept. Batr., pp. 67–68, 1890 (part)—Irazú, Costa Rica; Wettstein, Sitzber. Akad. Wiss. Wien, Math.-Nat. Kl., **143**, Abt. 1, p. 25, 1934; Smith, Proc. Biol. Soc. Wash., **49**, p. 95, 1936.

Sceloporus formosus malachiticus Wettstein, Sitzber. Akad. Wiss. Wien, Math.-Nat. Kl., **143**, Abt. 1, pp. 24–25, 28, 1934.

Type locality.—Upper Costa Rica. Type USNM 12186, collected by C. H. Riotte.

Distribution.—El Salvador and central Honduras to western Panama (fig. 6).

Diagnosis.—A *Sceloporus* of moderate size, maximum snout-vent measurement 91 mm.; a black shoulder spot present, lacking a narrow dorsal extension; dorsal scales 30 to 39, average 35; scales around body 30 to 45, average 37.9; ventral scales 36 to 46, average 42.2; femoral pores 11 to 17, average 14.3; frontal usually separated from interparietal; supraoculars in two irregular series; one or more supraoculars very frequently in contact with median head scales; one canthal or, if two, the first usually forced above canthal ridge; males usually with a light line down the center of each dorsal scale row.

Description.[1]—Head scales smooth, weakly convex, pitted; interparietal large, pentagonal, about two-thirds size of supraorbital area, about five times as large as either parietal; frontoparietals rarely divided; frontal in contact with interparietal or not; frontal normal; supraoculars four to six (inner row), usually five, these rarely entire, usually one or more scales divided, forming an outer row of

[1] Based mainly on UMMZ 71997, Santa Maria, Costa Rica.

smaller supraoculars; one row of small scales between supraoculars and median head scales, frequently incomplete, permitting one or more of the supraoculars to contact median head scales; one complete and another incomplete row of small scales between supraoculars and superciliaries; latter six, five usually visible from above; prefrontals in contact or not; frontonasals typical; nasal separated from rostral; internasals irregular; postrostrals irregular, usually four, frequently three or two (according to locality); usually one apparent canthal (in reality, usually two, but the first small and appearing in scales behind nasal); subnasal large, always present; preocular rarely divided; usually one loreal; usually two rows of lorilabials, rarely one, usually reduced to one row below subocular by contact of one or more scales with both subocular and supralabials; about four supralabials and five infralabials to a point below middle of eye.

Mental pentagonal, with a labial border about two-thirds that of rostral; about five or six pairs of postmentals, the scales of the anterior pair in contact medially; anterior scale of outer row of labiomentals narrowly separated from mental by partial contact of first postmental and first infralabial; gular scales smooth, single, notched, mucronate, and keeled immediately below ear.

Auricular lobules small, smooth, mucronate, smaller than preceding scales (occasionally subequal); temporal scales keeled, mucronate, weakly denticulate, the anterior scales smallest, the posterior scales subequal in size to largest scales between ear and nuchal fold; latter strongly keeled, strongly mucronate; a series of enlarged, strongly keeled, strongly mucronate scales extending from middle of nuchal fold to lower margin of ear; scales between nuchal pocket and arm subequal in size, keeled, strongly mucronate, denticulate.

Dorsal scales keeled, strongly mucronate, weakly denticulate, in weakly convergent rows; lateral scales about three-fourths size of dorsal scales, more strongly mucronate and denticulate; ventral scales smooth, each with a single apical notch, about one-half or one-third size of dorsal scales; interfemoral scales somewhat smaller than preanal scales, which are subequal in size to ventral abdominal scales; anterior preanal scales notched, posterior scales entire.

Dorsal scales of foreleg keeled, denticulate, mucronate, those on upper foreleg more strongly mucronate, about two-thirds size of dorsal scales on body, and somewhat larger than dorsal scales of lower foreleg; ventral scales of lower foreleg notched, smooth except

those on anteroventral surface and near hand, which are keeled; scales on ventral surface of upper foreleg smooth, notched, about one-half or one-third size of ventral scales of lower foreleg; lamellar formula for toes 9–13–17–19–13 (8–13–15–18–13).

Dorsal scales of hind leg keeled, rather strongly mucronate, weakly denticulate, subequal in size (the largest scales of either member), about two-thirds size of dorsal scales on body; scales on anterior surface of thigh smooth or weakly keeled, mucronate and denticulate, becoming notched, smooth and smaller on ventral surface; scales on posterior surface of thigh keeled, mucronate, the largest somewhat smaller than preanal scales; ventral scales on shank smooth, notched, nearly as large as dorsal scales of same member; lamellar formula for toes 8–12–19–20–14 (8–13–18–20–14).

Dorsal caudal scales strongly keeled, strongly mucronate, somewhat larger than dorsal scales on body; subcaudals smooth and with two apical notches at base of tail, becoming keeled and mucronate distally (both sexes); enlarged postanals present in males; no postfemoral dermal pocket.

Color.—General ground color in males malachite blue, olive green or olive brown; each dorsal scale row with a broad median lighter streak; these lighter lines separated from each other by narrow dark lines occupying the edges of two adjacent scale rows; limbs apparently with faint, darker bands; toes and fingers barred rather distinctly; tail with faint alternating dark and light bars.

Throat bluish, becoming darker posteriorly; gular fold region black, this color extending onto shoulder, but not onto back; sides of belly blue, with a dark blue or black median border, the two separated by four or five scale rows; this border not extending onto chest or into groin; chest, a band down middle of belly, and ventral surfaces of limbs and tail, immaculate, suffused with light blue (in some specimens, chest rather heavily suffused with black).

Females tend to be darker-colored above; both young and old females usually show four or six rows of large, rather sharply outlined, brown-black spots on the back, of which the two median continue onto the tail (Wettstein, 1934); the nuchal collar is fairly distinct, and complete in the young; throat and sides of belly bluish (apparently; in preservative these areas appear dark); remainder of belly dusky white.

The rows of dorsal spots are sometimes variously modified; in some, one or more rows have the individual spots fused to form

indistinct irregular stripes; the sides of the abdomen frequently have irregular indistinct darker and lighter areas.

Wettstein (1934), who had access to Zimara's field notes, states that this subspecies never has the throat colored orange-red, but always bluish. In the preserved material personally examined, this statement appears to be true.

Variation.—The variation in cephalic scutellation in 61 specimens was noted. Parietals one or two (1, four; 2, one hundred and eighteen); frontoparietals one or two (1, one hundred and eleven; 2, eleven); frontal touches interparietal in 27, separated by an azygous scale in two, by contact of frontoparietals in 32; anterior section of frontal longitudinally divided, posterior section transversely divided in one; superciliaries five to seven (5, five; 6, one hundred and ten; 7, seven); supraoculars entire in four; four to six scales in inner row of supraoculars (4, thirty-nine; 5, sixty-three; 6, twenty); one or more supraoculars contact median head scales in 31; prefrontals in contact medially in 15, separated by an azygous scale in 24, by contact of frontal with median frontonasal in 22; median frontonasal irregularly divided in one specimen, separated from one lateral frontonasal in one; usually two pairs of internasals; subnasal present in all; canthals usually two, occasionally one, the first usually forced above canthal ridge by contact of second canthal and subnasal; preocular divided on one side in one, on both sides in another; loreals none to five (0, seven; 1, ninety-three; 2, twenty; 3, one; 5, one); postrostrals two to five (2, twelve; 3, thirteen; 4, thirty-two; 5, one); two rows of lorilabials, reduced to one row below subocular by contact of one or more scales with both subocular and supralabials on one side in 12, on both sides in 29.

Dorsal scales 30 to 39, average 35 (75 counts: 30, one; 31, one; 32, five; 33, eleven; 34, twelve; 35, fifteen; 36, ten; 37, twelve; 38, five; 39, three); ventral scales 36 to 46, average 42.2 (61 counts: 36, one; 37, one; 38, four; 39, four; 40, five; 41, four; 42, nine; 43, twelve; 44, ten; 45, eight; 46, three); scales around body 30 to 45, average 37.9 (62 counts: 30, one; 31, one; 32, one; 34, four; 35, five; 36, six; 37, ten; 38, seven; 39, seven; 40, ten; 41, five; 42, two; 43, two; 45, one). Femoral pores 11 to 17, average 14.3 (116 counts: 11, one; 12, seven; 13, twenty-four; 14, thirty-one; 15, twenty-nine; 16, twenty; 17, four).

Remarks.—Wettstein (1934) states that the higher the elevation and the lower the average temperature the less brilliant the coloration and the less the maximum size. At a height of 3,000 meters on

the Volcan Irazú, Costa Rica, Zimara observed that the specimens were only half as large as those from the lower lakes, and all were so dull colored that the sexes could be distinguished only upon examination at close quarters. Wettstein concludes that Günther must have based his *S. irazuensis* on such specimens as these. Specimens collected by Zimara on the high plateau about San José, at elevations between 1,100 and 1,500 meters, showed brilliant coloration and obvious sexual dichromatism.

Specimens from Panama differ from others of this subspecies in having the frontoparietals broadly in contact (17 specimens, one exception, with an azygous scale between frontoparietals), and in usually having one or more supraoculars in contact with the median head scales (three specimens in 17 have the supraoculars completely separated from the median head scales). There apparently are no other differences accompanying these. Even these minor differences are not sufficiently well established, I believe, to warrant recognition of another race. Specimens from certain localities in Costa Rica tend strongly toward the Panama specimens in the condition of the supraoculars, and specimens from Honduras tend strongly toward the Panama specimens in the condition of the frontoparietals. Apparently these characters are subject to much geographical variation, notwithstanding the fact that they may be fairly constant in one locality.

Specimens from Salvador show evidence of intergradation with *f. smaragdinus*, their scale counts being relatively high (dorsal scales: 35, one; 38, two; 39, two. Scales around body: 40, two; 43, two; 45, one). These counts are almost exactly intermediate between those of *f. malachiticus* and *f. smaragdinus*.

Specimens of this subspecies from Honduras differ somewhat in coloration from the specimens from Salvador, Costa Rica, and Panama. The males show but slight evidence of the typical lined pattern (some show none); the black shoulder patch infrequently extends across the throat; and in females the dorsal surfaces of body and limbs are more distinctly banded and spotted. These apparent color differences may be due in part to manner of preservation. It may be noted that Jones' *schmidti*, from San Pedro, Honduras, does not belong to the *f. malachiticus* complex, having (according to the description) 42 dorsal scales. I associate it with *m. smaragdinus*, with which it agrees in coloration and scale counts.

Habits and habitat.—Specimens from Costa Rica and El Salvador (the former collected in January) contain young in the abdomen.

Nothing seems to have been published upon the habitat of this subspecies. Mrs. H. T. Gaige informs me that specimens observed in Panama occurred at an elevation of about 4,500 feet on boulders and fallen logs in relatively open areas.

Locality records.—EL SALVADOR: Los Esemiles, Chalatenango (FMNH 10958–62).

HONDURAS: (MCZ 9515–6); Portillo Grande, Yoro (FMNH 21872–5; MCZ 38851–4); Subirana Valley, Yoro (FMNH 21793; MCZ 38846–7[4]; UMMZ 77844[2]); Subirana Ranch (MCZ 38848–50, 32283–92; UMMZ 71289[10]); Mataderos Mts. (MCZ 38845[2]); San Juancito (Dunn and Emlen, 1932).

NICARAGUA: (MCZ 13890–1); Bluefields (AMNH 16234–5); Ocotal Pinelands (MCZ 9590–1).

COSTA RICA: San José (FMNH 2477–8[7]; AMNH 16324, 16326–25; ANSP 8487; CAS 54643–4; USNM 13540, 13543, 37500–3, 38689, 73529, 74513, 75439); Tablazo (ERD 8); Carpintera (ERD 3); Rio Virilla (ERD 1); Tilarán (ERD 1); Santa Clara (AMNH 16325); between Cartago and Agua Caliente (MCZ 32179); Esparta (MCZ 19134–5); Irazú (MCZ 20495–7, 15368–73); El Copey (MCZ 28075); La Estrella (MCZ 28074); Barba (MCZ 28076); Navarro (MCZ 15356–65; UMMZ 71765[2]); Rio Navarro, 4,000 ft. (UMMZ 74296–7[3]); Liberia, Guanacaste, 800 ft. (UMMZ 71995[2]); Har, 3,200 ft., Santa Maria, Guanacaste (UMMZ 71997 [6]); Alajuela (USNM 37504); Cartago (USNM 69453–4); Puntarenas, San José (USNM 73392); Upper Costa Rica (USNM 12186, 101062–5); San Isidro de Coronado, Hda. Guayabillos (Irazú, 2,200 meters), Hda. Chicua (Irazú, 2,800 meters), Orosi (Irazú) (Wettstein, 1934).

PANAMA: Above Boquete, Chiriquí (MCZ 31698–9); Quiel, district Boquete, Chiriquí (MCZ 34280); Boquete, Chiriquí (UMMZ 58016–8, 58020–4, 58026–36; USNM 51975).

Sceloporus asper Boulenger.

Sceloporus asper Boulenger, Proc. Zool. Soc. Lond., **1897**, pp. 476, 497–498, pl. 33 (colored), 1897; idem, **1898**, p. 915, 1898; Gadow, Proc. Zool. Soc. Lond., **2**, p. 232, 1905; Ahl, Zool. Anz., **106**, p. 184, 1934.

Sceloporus obscurus Van Denburgh, Proc. Acad. Nat. Sci. Phila., **1897**, p. 462, 1898—Tepic, Nayarit (type, CAS 3213, collected by Gustav Eisen).

Type locality.—La Cumbre de los Arrastrados, Jalisco.

Distribution.—Mountainous regions of western Mexico from Nayarit to Guerrero (fig. 5).

Diagnosis.—A *Sceloporus* of moderate size, maximum snout-vent measurement 81 mm.; shoulder spot faint; scales on posterior surface of thigh about two-thirds size of preanal scales; dorsal scales 29 to 35, average 33.3; ventral scales 45 to 56, average 50.3; scales around body 40 to 48, average 43.7; femoral pores 15 to 19, average 16.8; dorsal scales strongly keeled, strongly mucronate; largest median lateral scales two-thirds size of dorsal scales; ventral scales one-fourth size of dorsal scales; supraoculars irregular; two canthals; anterior section of frontal usually longitudinally divided. Gular region of males immaculate; sides of belly pale blue, not dark-bordered; middle of abdomen light.

Description.[1]—Head scales rather strongly convex, smooth, pitted; interparietal subtriangular, about three and one-half times as large as either parietal; parietals single on each side; fronto-parietals one or two on each side; frontal in contact with interparietal; anterior section of frontal usually longitudinally divided; two rows of supraoculars, the scales of the outer row much smaller than those of the inner row; one row of small scales separating supraoculars from median head scales, and another separating them from superciliaries; usually six or seven superciliaries, five or six visible from above; prefrontals usually separated medially by an azygous scale; frontal ridges distinct, enclosing a distinct depression between; frontonasals typical; internasals more or less irregular; nasal separated from rostral; normally four postrostrals; subnasal large; two canthals typical; usually one loreal; preocular frequently divided; usually two distinct rows of lorilabials, one row occasionally nearly obsolete; two postoculars; three and one-half to four and one-half supralabials, and five or six infralabials to a point below middle of eye.

Mental triangular, with a labial border slightly less than half that of rostral; five or six pairs of postmentals, the scales of the first pair narrowly separated medially, the scales of the other pairs widely separated; posterior median gular scales weakly notched; gular scales very weakly striated, those toward sides of neck keeled, strongly mucronate.

Auricular lobules short, about four in number, the lower ones distinctly keeled, all smaller than preceding scales; temporal scales keeled, not mucronate, much smaller anteriorly than posteriorly, the largest larger than scales between ear and lateral nuchal pocket; a row of enlarged, very strongly keeled, strongly mucronate scales

[1] Based mainly on EHT 8678A, female, Uruapan, Michoacán.

extending from upper end of nuchal fold to lower edge of ear; of the scales between nuchal pocket and arm, the upper ones largest, most strongly keeled, and weakly denticulate, the lower of these scales somewhat smaller, less strongly keeled, the scales between these two groups of scales separated from each other by a group of considerably smaller scales.

Dorsal scales strongly keeled, strongly mucronate, not denticulate, in slightly oblique rows, those on neck most strongly keeled; lateral scales less strongly keeled than dorsals, very weakly denticulate, about two-thirds size of dorsal scales; ventral scales smooth, notched, about one-fourth size of dorsal scales; interfemoral scales much smaller than preanal or median abdominal scales.

Dorsal scales of foreleg keeled, rather strongly mucronate, not denticulate, those on upper foreleg about one-half or three-fifths size of dorsals on body, somewhat larger than those on lower foreleg; ventral scales of lower foreleg smooth, notched, except those near hand and near anterior surface, which are keeled and mucronate; ventral scales of upper foreleg notched, smooth except toward anterior and posterior surfaces, about one-third size of those of lower foreleg; lamellar formula for fingers 9–14–?–18–13 (9–13–18–18–14).

Dorsal scales of hind leg keeled, mucronate, weakly denticulate, those on shank about two-thirds size of dorsals on body, somewhat larger than those on thigh; ventral scales smooth, notched, those near femoral pore series weakly keeled; largest scales on posterior surface of thigh about two-thirds size of preanal scales; ventral scales on shank smooth, pointed, slightly smaller than dorsal scales of same member; lamellar formula for toes 9–14–17–21–15 (8–13–17–20–16).

Dorsal caudal scales slightly larger and more strongly keeled and mucronate than scales on middle of back; subcaudals near base of tail weakly keeled, mucronate, becoming more strongly keeled distally (females); enlarged postanals present in males; no postfemoral dermal pocket.

Color.—In males, olive or hair brown above, with a decided bluish tinge mid-dorsally; limbs faintly banded with darker brown; tail with narrow very light gray bands; an indistinct black spot in front of shoulder. Belly mixed pale blue and pearl blue, lighter medially; chest, throat, and ventral surfaces of limbs and tail dingy white, with a tinge of blue; region anterior to gular fold tinged with brown or black, with irregular small light flecks; a median ventral, narrow line on the throat is dingy white.

Females similar to males, except for faint, undulate, darker brown bands, about three in number, extending across back; shoulder spots extending upward, separated from each other medially by about three or four scales; belly dingy white, with a bluish tinge; throat darker than belly, with a narrow, lighter, median ventral band two scales wide.

Variation.—The variation in the scutellation of the head in 16 specimens is as follows: One parietal in all; frontoparietals one or two (1, twenty; 2, twelve); frontal touches interparietal in all; anterior section of frontal longitudinally divided in 12, transversely divided in one; posterior section of frontal transversely divided in one; frontal normal in two; superciliaries five to seven (5, one; 6, eighteen, 7, thirteen); supraoculars (inner row) four to six (4, five; 5, twenty-two; 6, five); outer row of supraoculars with two to four scales, usually three; prefrontals contact medially in one; frontal contacts median frontonasal in two, separated by an azygous scale in 12; frontonasals irregular in one, the median separated from lateral frontonasals on one side in four, normal in others; internasals more or less irregular, usually paired; subnasal present in all; two canthals in all, the first forced above canthal ridge by contact of second canthal and subnasal on one side in one; preocular divided in six; two loreals on one side in two; three postrostrals in one, four in others; two rows of lorilabials, reduced to one row below subocular by one or more scales in contact with both subocular and supralabials on one side in three, on both sides in nine.

Dorsal scales 29 to 35, average 33.3 (16 counts: 29, one; 31, two; 32, one; 33, three; 34, five; 35, four); ventral scales 45 to 56, average 50.3 (16 counts: 45, one; 47, two; 49, three; 50, four; 51, one; 52, one; 53, one; 54, one; 55, one; 56, one); scales around body 40 to 48, average 43.7 (15 counts: 40, one; 41, two; 42, three; 43, three; 44, one; 45, one; 46, one; 47, one; 48, two). Femoral pores 15 to 19 (29 counts: 15, seven; 16, five; 17, seven; 18, nine; 19, one).

Habits and habitat.—The species definitely tends to avoid heavy woods and small trees. During about ten days of constant collecting at Uruapan, Michoacán, in 1935 and 1936, only two specimens were collected outside of a sparsely forested area described below. After discovery of the first specimen, a day or two after collecting was begun, the species was carefully sought, but only one other specimen was secured. One of these two was taken at the edge of a heavy forest, sunning itself on the side of a large tree. Along with it were a number of *S. m. microlepidotus*, whose actions and general

coloration were remarkably similar. In fact, it was not until after the specimen of *asper* was shot that it was realized that two species occurred on the trees of that region. The second specimen was discovered on the sunny side of a small tree in an open area.

It was not until the last day of my stay at Uruapan that the preferred habitat of *asper* was discovered. East of the city, near the railroad station, was a sparse forest, consisting of very tall pine trees, where the sun shone on nearly every tree for its full length. Fourteen were collected in two or three hours, together with quantities of *S. m. microlepidotus*. Here, however, the two species could easily be distinguished at a distance. The latter form was less wary, and never ascended to considerable heights in trees. All specimens of *asper* observed here were sunning themselves high on the tree trunks. It was necessary to sight the specimens at a distance, and approach cautiously to avoid scaring them. All were shot with .22 bullets, as they were beyond the range of .22 shot shells. Collecting was successfully continued until the usual late morning rains started, when the lizards disappeared.

Locality records.—MICHOACÁN: Uruapan (EHT 8678A, 8678–92). JALISCO: La Cumbre de los Arrastrados (Boulenger, 1897). GUERRERO: Chilapa (Ahl, 1934). NAYARIT: Tepic (CAS 3213).

Sceloporus salvini Günther.

Sceloporus torquatus formosus Cope, Proc. Amer. Phil. Soc., **22**, p. 402, 1885; Ferrari-Perez, Proc. U. S. Nat. Mus., **9**, p. 193, 1886; Cope, Bull. U. S. Nat. Mus., **32**, p. 38, 1887; idem, Ann. Rept. U. S. Nat. Mus., **1898**, pp. 340, 349, 1900.

Sceloporus formosus Boulenger, Cat. Liz. Brit. Mus., **2**, pp. 217, 222–223, 1885 (part); idem, Proc. Zool. Soc. Lond., **1897**, pp. 501–503, 1897 (part).

Sceloporus salvini Günther, Biol. Cent.-Amer., Rept. Batr., p. 68, 1890; Wettstein, Sitzber. Akad. Wiss. Wien, Math.-Nat. Kl., **143**, Abt. 1, p. 25, 1934; Smith, Proc. Biol. Soc. Wash., **49**, p. 95, 1936.

Type locality.—Jalapa. Lectotype specimen *o*, male, in Boulenger's (1897) table, page 503 (cf. "Remarks," *Sceloporus formosus formosus*, p. 40).

Distribution.—Unsatisfactorily known, recorded only from Jalapa, in central-western Vera Cruz and Santo Domingo, Oaxaca (fig. 5).

Diagnosis.—A moderately large *Sceloporus*, maximum snout-vent measurement 95 mm.; scales on posterior surface of thigh keeled, mucronate, somewhat more than half size of preanal scales; a complete, dorsal nuchal collar three or four scales wide, sometimes abruptly broken medially by a narrow space about the width of

one scale row; nuchal collar not light-bordered; two regular rows of supraoculars; lateral frontonasals separated from median frontonasals; internasals highly irregular, small, numerous; a distinct depression in median prefrontal region, surrounded by ridges; dorsal scales 39 to 44, average 41.2; ventral scales 41 to 50, average 45.1; scales around body 35 to 46, average 42.2; femoral pores 11 to 14, average 12.5.

Description.[1]—Head scales smooth, pitted; a rather distinct depression in median part of prefrontal area, surrounded by slight ridges; interparietal pentagonal, sides parallel, the scale about three times the size of either parietal; parietal single on either side; one rectangular frontoparietal on each side, the two separated by an azygous scale; frontal typically divided; supraoculars divided, the largest scale of the outer row about two-thirds size of largest scale of inner row; four scales in outer row of supraoculars, six–seven in the inner row; supraoculars separated from median head scales by a single row of small scales, from superciliaries by one complete and another incomplete row of small scales; six superciliaries, five visible from above; prefrontals separated by an azygous scale; median frontonasal subequal in size to, or slightly smaller than, either lateral frontonasal, and separated from latter scales by a small scale on each side; internasals highly irregular; four postrostrals; nasals small, separated from rostral; subnasal large; two canthals, first somewhat smaller than second; one loreal on each side; preocular entire; two postoculars; two rows of lorilabial scales, reduced to one row at a point below subocular by a single scale in contact with both subocular and supralabial scales; four supralabials and five infralabials to a point below middle of eye.

Mental pentagonal, with a labial border about two-thirds that of rostral; four pairs of postmentals, the scales of the anterior pair in contact medially, the others separated; outer row of labiomentals terminating anteriorly with the last scale inserted between the posterior part of the first postmental and first infralabial; gular scales below ear pointed, keeled; other gular scales with a single apical notch; scales in gular fold region usually with two, occasionally with three, apical notches.

Auricular lobules three on each side, smooth, the upper and lower pointed, the median rounded and twice as large as the others; largest auricular lobule extending about one-half distance across ear opening, slightly larger than preceding scales; temporal scales

[1] Based on USNM 6308, Jalapa.

keeled, mucronate, decreasing in size anteriorly, the largest subequal in size to largest scales between ear and nuchal pocket; scales surmounting lateral nuchal fold strongly mucronate; scales between nuchal pocket and arm strongly denticulate, strongly mucronate, keeled, subequal in size to or slightly smaller than largest scales between ear and nuchal pocket.

Dorsal scales keeled, mucronate, denticulate, in slightly convergent rows, 39 from occiput to base of tail; lateral scales similar to dorsals, more strongly denticulate, in oblique rows, subequal in size to dorsal scales; ventral scales weakly notched, those in midventral line somewhat smaller than lateral ventral scales; midventral scales about three-fourths size of dorsal scales; scales in groin strongly denticulate; scales around body 44; ventral scales 44.

Dorsal scales of foreleg keeled, mucronate, those on upper foreleg about two-thirds size of dorsals on body, slightly larger than dorsals of lower foreleg; scales of lower foreleg more or less uniform in size except those on anterior surface; scales on ventral surface of lower foreleg keeled; ventral scales of upper foreleg smooth, notched, about one-half size of ventrals of lower foreleg; lamellar formula for toes 8–13–17–18–13 (9–13–17–19–13).

Dorsal scales of hind leg keeled, mucronate, weakly denticulate, subequal in size, about three-fourths size of dorsals on body; ventral scales of thigh smooth, pointed, becoming smaller toward femoral pore series, larger toward anterior surface of thigh; femoral pores 11–13; scales on posterior surface of thigh keeled, mucronate, weakly denticulate, the largest about three-fifths size of preanal scales; ventral scales on shank smooth, pointed, as large as or larger than dorsals on body; lamellar formula for toes 7–12–17–21–16 (7–12–17–20–15).

Dorsal caudal scales very strongly keeled, strongly mucronate, nearly twice as large as dorsals on body; subcaudals keeled except immediately behind anus, mucronate, denticulate; postanals enlarged; no postfemoral dermal pocket.

Color.—Dorsal ground color dull olive-gray; males apparently with a dark line down the center of each scale row; a broad complete black nuchal collar, narrowly interrupted in the mid-dorsal line in females; a light pineal spot; digits barred; tail with poorly defined undulate dark bands.

Infralabial region greenish in males; remainder of gular area pale blue, sometimes with a large medial area pinkish; gular fold region black, the color continuous with that of nuchal collar; chest pale

lavender in younger specimens, mostly black in the older; sides of belly lavender of varying shades, this color bordered medially by a narrow dark blue band followed medially by a narrow black band; these dark borders not extending into groin; a broad, light band, about four scales wide in center of abdomen, extending posteriorly from posterior part of chest, narrower anteriorly than posteriorly; ventral surfaces of limbs white.

Females with a series of about six rounded, indistinctly outlined, dark spots on each side of mid-dorsal line on body, these spots continuing onto tail and coalescing to form bands; two or three irregular rows of spots lateral to the above; limbs faintly barred. Ventral surfaces immaculate. Gular region with a faint bluish suffusion.

Variation.—The variation in cephalic scutellation of 14 specimens is as follows. Parietals one or two (1, twenty-two; 2, six); frontoparietals one or two (1, twenty-five; 2, one); frontal in contact with interparietal in five, separated by an azygous scale in seven, by contact of frontoparietals in one; frontal normal in all; superciliaries usually six, seven on one side in one; three to five scales in outer row of supraoculars (3, four; 4, nineteen; 5, five); five to seven scales in inner row of supraoculars (5, eight; 6, sixteen; 7, four); prefrontals separated by an azygous scale in 12, by contact of frontal with median frontonasal in two; median frontonasal separated from lateral frontonasals in all; subnasal present in all; two canthals in all, the first forced above canthal ridge on one side in two, on both sides in seven; preocular partly divided in two; one loreal in all; five postrostrals in one, four in others; two rows of lorilabials, reduced to one row below subocular by contact of one or more scales with both subocular and supralabials on one side in five, on both sides in three.

Dorsal scales 39 to 44, average 41.2 (14 counts: 39, two; 40, four; 41, three; 43, four; 44, one); ventral scales 41 to 50, average 45.1 (12 counts: 41, one; 42, one; 43, one; 44, three; 45, two; 47, two; 49, one; 50, one); scales around body 35 to 46, average 42.2 (12 counts: 35, one; 38, one; 41, one; 42, one; 43, four; 44, three; 46, one). Femoral pores 11 to 14, average 12.5 (28 counts: 11, five; 12, eight; 13, eleven; 14, four).

Habits and habitat.—The specimens collected by Nelson and Goldman near Santo Domingo, Oaxaca, are said to have been found "in woods about tree butts and on logs and stumps."

Locality records.—VERA CRUZ: (ANSP 12435); Jalapa (MCZ 2853[6]; USNM 6308[4]); El Encero and Jalapa (USNM 2962). OAXACA: Mts. near Santo Domingo (USNM 47330–1).

THE SPINOSUS GROUP[1]

Twenty-one species and subspecies are included in the *spinosus* group. They are as follows: *lunaei, acanthinus, melanorhinus, edwardtaylori, clarkii clarkii, clarkii boulengeri, orcutti orcutti, orcutti licki, lundelli lundelli, lundelli gaigeae, magister magister, magister*

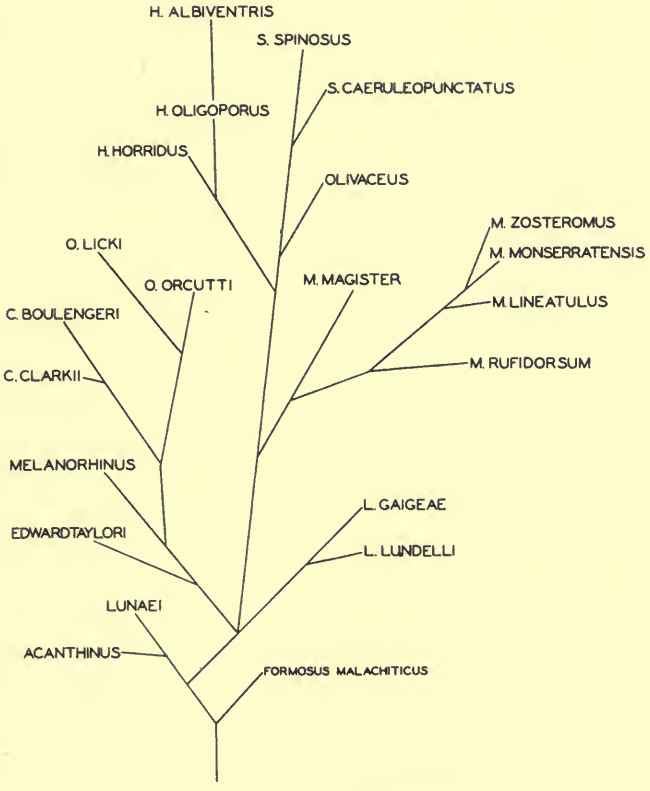

FIG. 7. Phylogeny of the *spinosus* group.

rufidorsum, magister monserratensis, magister zosteromus, magister lineatulus, spinosus spinosus, spinosus caeruleopunctatus, olivaceus, horridus horridus, horridus oligoporus, and *horridus albiventris.* Two names have been synonymized: *digueti* Mocquard with *orcutti orcutti,* and *guentheri* Stejneger with *acanthinus. S. floridanus,* which has long been considered in this group (in fact, a subspecies of *spinosus*), has been placed in the *undulatus* group as a subspecies of *undulatus,*

[1] Approximately 5,022 specimens examined.

following Burt (1936). Thereby *olivaceus* becomes available for the Texan and northern Mexican form previously referred to *floridanus* and is retained as a species.

Other changes are few. *S. magister* is recognized as a species distinct from *clarkii;* the Lower Californian forms, *rufidorsum, monserratensis, zosteromus,* and *lineatulus,* are considered to be subspecies of *magister. S. m. monserratensis* is regarded as inhabiting not only Monserrate Island but also southern Lower California, exclusive of the Cape region. *S. licki,* the Cape derivative of *orcutti,* is considered a subspecies of the latter. *S. horridus* is revived as a species, including three subspecies.

The most primitive form of the group is undoubtedly *lunaei,* which is closely related to *formosus malachiticus. S. acanthinus* is a near relative of *lunaei,* as is also *lundelli.*

S. magister seems to be a derivative of the stock which gave rise directly to *spinosus,* while *clarkii* appears to be more closely related to *melanorhinus* and *lundelli. S. orcutti* is rather definitely the western derivative of *clarkii.* The accompanying diagram illustrates my idea of the course of phylogeny in the group.

The habits of the members of the group are highly variable. Some live almost entirely on the ground, others in rocks, others in trees. No species ascends to an elevation much greater than 5,500 feet. So far as known, all the species are oviparous.

The characters held in common by members of this group are: absence of a dorsal, light-bordered nuchal collar; dorsal scales relatively large (minimum, 26; maximum, 40); dorsal scales strongly mucronate (except *o. orcutti*); ventral scales smooth, notched; postanals enlarged in males; scales on posterior surface of thigh large; supraoculars in a single series, usually very large, usually partially in contact with median head scales; femoral pores widely separated medially; dorsal surface not a brilliant blue in males (except *lunaei* and *acanthinus*); belly colored in males (except *h. albiventris* and *edwardtaylori*); relatively large size (maximum snout-vent measurement of smallest species, 86 mm.; of largest species, 140 mm.).

The following key to the species and subspecies of the group is submitted with reservations. The key is based on average scale counts; a certain small per cent of the specimens are expected to key out incorrectly. The group is so compact, with so many species and subspecies linking the poorly defined subgroups, that the key has of necessity been made artificial. Related species and subspecies are frequently widely separated in the key due to the use of some

character of minor importance, but easily defined. It must be emphasized that the key will not work backwards, as several times subgroups are selected out, one or two forms eliminated, and then the remainder of the species of the subgroup referred back to the body of the key.

KEY TO THE SPECIES AND SUBSPECIES OF THE SPINOSUS GROUP

1.—Femoral pores on both thighs total seven or more....3
Femoral pores on both thighs total six or less....2

2.—Ventral surfaces immaculate in adults of both sexes.
horridus albiventris (p. 108)
Sides of belly blue, frequently dark-bordered, in males; gular region barred in males, sometimes in females.... *horridus horridus* (p. 98)

3.—A dorsal nuchal collar present, about two scales wide, frequently abruptly broken medially by a narrow space one or two scales wide; outer row of labiomentals separated from mental; first canthal separated from lorilabials; belly patches in males passing across chest to gular region; femoral pores 12 or more; two series of dark spots down back in females.
acanthinus (p. 74)
No dorsal nuchal collar; or, if present, first canthal in contact with lorilabials and belly patches not extending over chest in males....4

4.—Supraoculars completely in contact with superciliaries, or with one to four very small scales between; posterior superciliary greatly enlarged; venter immaculate in both sexes.... *edwardtaylori* (p. 78)
Supraoculars separated from superciliaries by at least one row of small scales; posterior superciliary not enlarged; venter with distinct markings in males....5

5.—Femoral pores on both thighs total 12 or less; four supraoculars, the fourth in contact with median head scales.... *horridus horridus* (p. 98)
Femoral pores on both thighs total 13 or more; or, if 12, all supraoculars separated from median head scales....6

6.—Femoral pores (one side) 17 or more....7
Femoral pores (one side) 16 or less....10

7.—One canthal.... *lunaei* (p. 63)
Two canthals....8

8.—A black shoulder patch present, with a light posterior border....10
No black shoulder patch; or, if present, without a light posterior border...9

9.—Snout black; a broad, black bar across head at middle of supraocular region; chest and middle of belly orange in males; gular region in females white, with irregular, black marks; first canthal not in contact with lorilabials; ventral scales 44 to 54.... *melanorhinus* (p. 82)
Snout not black, similar in color to rest of head; no black bar across head; chest and middle of belly not orange; gular region in both sexes bluish, with light lines following the scale rows at anterior part of throat; first canthal in contact with lorilabials; ventral scales 38 to 42.
magister lineatulus (p. 168)

10.—One or more supraoculars in contact with median head scales....15
None of supraoculars in contact with median head scales....11

11.—Gular region barred....12
Gular region not barred....13

12.—Dorsal scales usually more than 30; femoral pores usually more than nine (one side); supraoculars usually five to seven.
spinosus caeruleopunctatus (p. 94)
Dorsal scales usually 30 or less; femoral pores usually nine or less (one side); supraoculars usually four.... *spinosus spinosus* (p. 87)

13.—One canthal ..... *lunaei* (p. 63)
Two canthals 14

14.—Belly patches in males continuous across chest; prefrontals never in contact; no dorsolateral light lines in males; posterior surface of thigh mottled or with a broad light line, dark-bordered 15
Belly patches small, confined to sides of belly in males; prefrontals usually in contact; dorsolateral light lines present in males; posterior surface of thigh nearly immaculate or with a narrow, short black line near insertion of hind leg ..... *olivaceus* (p. 110)

15.—Gular region barred 16
Gular region not barred 17

16.—Femoral pores 13 or more (one side) ..... *orcutti licki* (p. 140)
Femoral pores 12 or less (one side) ..... *spinosus spinosus* (p. 87)

17.—One canthal ..... *lunaei* (p. 63)
Two canthals 18

18.—Femoral pores (one side) 12 or less 19
Femoral pores (one side) 13 or more 23

19.—Outer row of labiomental scales in contact with mental.
magister magister (p. 145)
Outer row of labiomental scales separated from mental 20

20.—First canthal in contact with lorilabials ..... *orcutti orcutti* (p. 133)
First canthal separated from lorilabials 21

21.—Lateral scales about one-half size of dorsal scales; median frontonasal not in contact with frontal; lateral belly patches in males not passing over chest 23
Lateral scales considerably more than one-half size of dorsal scales; median frontonasal usually in contact with frontal; lateral belly patches in males passing over chest 22

22.—Dorsal markings absent or very dimly visible; a broad, light line on posterior surface of thighs ..... *lundelli gaigeae* (p. 71)
Dorsal markings present and distinct at least in females, consisting of narrow, dark crossbars; posterior surface of thigh mottled. . *lundelli lundelli* (p. 66)

23.—Femoral pores (one side) 10 or less 24
Femoral pores (one side) 11 or more 25

24.—First canthal rarely in contact with lorilabials; gular region never barred; outer row of labiomentals rarely in contact with mental.
clarkii boulengeri (p. 128)
First canthal usually in contact with lorilabials; gular region barred, or outer row of labiomentals sometimes in contact with mental (not in *o. orcutti*) 25

25.—First canthal separated from labiomentals; femoral pores 16 or less; lower forelegs distinctly barred; gular region never barred. *clarkii clarkii* (p. 118)
First canthal in contact with lorilabials; lower forelegs not barred distinctly 26

26.—Outer row of labiomentals in contact with mental; gular region not barred; shoulder patch distinct 28
Outer row of labiomental scales separated from mental; gular region barred or shoulder patch indistinct 27

27.—Dorsal scales 32 to 40; femoral pores 13 to 19; usually one or more scales in contact with both subocular and supralabials; a distinct, light-bordered, black shoulder patch; dorsolateral light lines present, indistinct posteriorly, the medial edge sometimes indistinct ..... *orcutti licki* (p. 140)
Dorsal scales 28 to 36; femoral pores 10 to 15; usually two complete rows of lorilabials below subocular; shoulder patch indistinct; no dorsolateral light lines ..... *orcutti orcutti* (p. 133)

28.—Supraoculars usually five; femoral pores (one side) usually 15 or less. *magister magister* (p. 145)
Supraoculars usually six or seven; femoral pores usually 16 or more.....29

29.—No dark lines in adult males on sides of lateral scale rows; femoral pores (one side) usually less than 19; lateral belly patches confluent medially in adult males..... *magister rufidorsum* (p. 161)
Dark lines on sides of lateral scale rows present in adult males; lateral belly patches not confluent medially in adult males.....30

30.—A distinct, narrow dorsal stripe about one and two half scale rows wide; females and young with two rows of dark spots, one on either side of mid-dorsal stripe.....*magister monserratensis* (p. 165)
A broad, light-colored dorsal area about six scale rows wide; dark spots on back absent or indistinct..... *magister zosteromus* (p. 170)

Sceloporus lunaei Bocourt.

Sceloporus lunaei Bocourt, Ann. Sci. Nat., Zool., (5), **17**, No. 10, p. 1, 1873; idem, Miss. Sci. Mex., Zool., **3**, sec. 1, pp. 184–186, pl. 18bis, figs. 5, 5*a*, 5*b*, 1874; Cope, Proc. Amer. Phil. Soc., **22**, p. 400, 1885; idem, Bull. U. S. Nat. Mus., **32**, p. 37, 1887; Günther, Biol. Cent.-Amer., Rept. Batr., p. 67, 1890; Cope, Ann. Rept. U. S. Nat. Mus., **1898**, p. 335, 1900; Wettstein, Sitzber. Akad. Wiss. Wien, Math.-Nat. Kl., **143**, Abt. 1, p. 25, 1934; Smith, Proc. Biol. Soc. Wash., **49**, p. 95, 1936.

Sceloporus acanthinus Müller, Verh. Naturf. Ges. Basel, **6**, pp. 573, 633, 1878.

Sceloporus formosus Werner, Abh. Bayer. Akad. Wiss., Math.-Phys. Kl., **22**, Abt. 2, p. 344, 1903.

Type locality.—Plateau of Guatemala.

Distribution.—Known only from the Motagua Valley and the desert areas of Baja Verapaz, Guatemala (fig. 8).

Diagnosis.—A moderately large *Sceloporus*, maximum snout-vent measurement 95 mm.; one canthal (the first entirely absent); supraoculars moderate in size; sometimes one or two very small scales segmented off from outer parts of supraoculars; one complete and one or two incomplete series of scales between supraoculars and superciliaries; one or two posterior supraoculars frequently in contact with median head scales; frontal ridges distinct; dorsal scales 31 to 38; a black shoulder patch in males, none in females; females with two series of dark spots down back; males uniform greenish olive above.

Description.[1]—Head scales smooth, slightly convex, somewhat pitted; a weak depression at anterior edge of frontal; interparietal pentagonal, the sides parallel, about twice the size of either parietal; frontoparietals rectangular, one on each side, separated medially by contact of interparietal and frontal; frontal divided, the anterior section as broad as long, narrower posteriorly; four or five supraoculars, separated from median head scales by one row of small

[1] Based on USNM 25219, from Guatemala.

scales and from superciliaries by one complete and another two-thirds complete row of small scales; superciliaries six, five visible from above; prefrontals very small, widely separated by contact of frontal and median frontonasal; lateral frontonasals about three-fifths the size of median frontonasal; posterior pair of internasals distinct, the other irregular; four postrostrals; subnasal present; one large canthal; loreal single, small; preocular entire; two postoculars; two rows of lorilabial scales, complete below subocular; four and one-half supralabials and five infralabials to a point below middle of eye.

Mental triangular, with a labial border two-thirds that of rostral; four pairs of postmentals, the scales of the anterior pair in contact medially; outer row of labiomentals narrowly separated from mental by partial contact of first infralabial and first postmental; gular scales considerably larger posteriorly than anteriorly, notched; scales in gular fold region with two apical notches.

Four auricular lobules, subequal in size, smaller than preceding scales, extending about one-third distance across ear opening; temporal scales keeled, mucronate, weakly denticulate, much smaller anteriorly than posteriorly, the largest subequal in size to largest scales between ear and nuchal pocket; scales below ear keeled, mucronate; scales between nuchal pocket and arm somewhat larger than scales between ear and nuchal pocket, very weakly keeled, rather strongly mucronate, weakly denticulate.

Dorsal scales weakly keeled, strongly mucronate, weakly denticulate, in nearly parallel rows; lateral scales similar to dorsals, more strongly denticulate, somewhat smaller; ventral scales smooth, notched, about one-half size of dorsal scales; interfemoral scales slightly smaller than preanal scales.

Dorsal scales of foreleg weakly keeled, mucronate, denticulate, those on upper foreleg slightly larger than dorsals on lower foreleg and about two-thirds to three-fourths size of dorsals on body; scales on posteroventral surface of lower foreleg keeled, mucronate, denticulate; scales on anterior surface of same member smooth, somewhat larger than dorsal scales of lower foreleg; ventral scales of upper foreleg smooth, notched, about one-half size of ventral scales of lower foreleg; lamellar formula for fingers 10–14–17–17–12 (9–14–17–18–14).

Dorsal scales of hind leg strongly keeled toward apex, very strongly mucronate, not denticulate, subequal in size, about three-fourths size of dorsals on body; scales on ventral and anterior surfaces of thigh smooth; ventral thigh scales notched; scales on posterior

surface of thigh keeled, notched, subequal in size or slightly smaller than preanal scales; scales on ventral surface of shank smooth, notched, somewhat larger than dorsal scales of same member; lamellar formula for toes 8–12–18–20–14 (8–12–18–21–14).

Dorsal caudal scales keeled, mucronate, not denticulate, somewhat larger than largest dorsals on body; basal subcaudals smooth, somewhat irregular-edged; distal caudals becoming keeled, mucronate; enlarged postanals present; no postfemoral dermal pocket.

Color.—Males are uniform greenish olive above; toes indistinctly barred; tail not visibly barred; a black shoulder spot, extending across gular fold region, not extending onto shoulder; lower labial region greenish; anterior part of throat pinkish, posterior part dark blue; chest with a bluish tinge; sides of belly pale lavender, bordered medially by dark blue; the blue borders uniting on posterior part of chest, diverging slightly posteriorly and extending to, but not into, groin; preanal region bluish; ventral surfaces of limbs and tail dusky white. In other males the sides of the belly and chest are dark blue.

In females, the ground color is darker than in males; a series of about ten very irregular dark brown spots on each side of back, the spots round posteriorly, narrow and somewhat serrate anteriorly; about seven very irregular dark brown bars on sides; sometimes a narrow, dark brown bar extending from anterior margin of arm insertion onto sides of neck; limbs with very narrow broken bands; digits barred. Ventral surfaces immaculate, with faint dark spots in gular region.

A young specimen (26.6 mm. snout-vent) from Quirígua, Guatemala (USNM 58526) has the throat and chest finely mottled; two rows of spots down each side of mid-dorsal line; a small, dark spot directly above anterior margin of arm insertion; digits very distinctly barred.

Variation.—The variation in cephalic scutellation of 14 specimens is as follows: two parietals on both sides in two; frontoparietal divided on one side in one; frontal touches interparietal in 11, separated by contact of frontoparietals in three; five superciliaries on both sides in two; supraoculars four to six (4, seventeen; 5, ten; 6, one); one or more supraoculars in contact with median head scales in eight; prefrontals in contact medially in three, separated by contact of frontal and median frontonasal in 11; frontonasals normal in all; subnasal present and one canthal in all; preocular divided on one side in one, on both sides in five; loreals one to three (1, nineteen; 2, eight; 3, one); lorilabials reduced to one row below subocular by

contact of one or more scales with both subocular and supralabials on one side in two, on both sides in five.

Dorsal scales 31 to 38, average 34.7 (14 counts: 31, one; 33, two; 34, five; 35, one; 36, two; 37, two; 38, one); ventral scales 38 to 44, average 40.6 (14 counts: 38, one; 39, one; 40, one; 41, two; 42, four; 43, four; 44, one); scales around body 32 to 38, average 35.6 (14 counts: 32, one; 34, two; 35, four; 36, four; 38, three); femoral pores 12 to 17, average 14.9 (28 counts: 12, one; 13, three; 14, seven; 15, six; 16, eight; 17, three).

Remarks.—*Sceloporus lunaei*, as here considered, appears to be specifically distinct from *f. malachiticus*, *f. smaragdinus*, and *acanthinus*. The differences from *l. lundelli*, which occurs in northern Guatemala and adjacent territories, are more obvious (see discussion under *lundelli lundelli*). *S. lunaei* differs from *acanthinus* by lacking the complete, broad nuchal collar, in having smaller supraoculars, larger scales, and in its single canthal.

From *f. malachiticus*, *lunaei* differs in always having the supraoculars entire; no light stripe down each dorsal scale row; and a somewhat different ventral coloration, the blue being practically uniform over the posterior part of throat, chest, and entire ventral surface of abdomen. A close relationship with *f. malachiticus* is shown in the females, which cannot be distinguished by color. The only difference observable in females lies in the supraoculars, which are entire in *lunaei*, divided in *f. malachiticus*. This difference is not constant, as some specimens of *f. malachiticus* have entire supraoculars.

This species has been the most difficult in the group to define and place satisfactorily, due to lack of sufficient material with adequate data. It is not impossible that *lunaei* is a subspecies of *formosus*, intergrading with *f. malachiticus*, in which case it would become a member of the *formosus* group. I think it less likely that it intergrades with *acanthinus*, as the latter has numerous stable characters which differ from those of *lunaei*.

Locality records.—GUATEMALA: (ANSP 8481–4, 8486; MCZ 5832; USNM 6771[4], 25219–20); Quirígua (USNM 58526); Salamá (FMNH 20674–5).

Sceloporus lundelli lundelli sp. and subsp. nov.

Sceloporus torquatus serrifer Stuart, Occ. Papers Mus. Zool. Univ. Mich., **292**, p. 11, 1934.

Type from Cohune Ridge (20 miles southeast of Benque Viejo), British Honduras. Museum of Zoology, University of Michigan No. 80674. Collected by C. L. Lundell.

Distribution.—The base of the Yucatan Peninsula, from Campeche to British Honduras (fig. 8).

Diagnosis.—A *Sceloporus* of moderately large size, maximum snout-vent measurement 86 mm.; dorsal scales 28 to 34; supraoculars large, usually four or five, rarely six, the posterior one or two usually at least partially in contact with median head scales; frontal usually in contact with median frontonasal; two canthals, normal in position; one loreal; femoral pores nine to twelve. A black shoulder spot in males, sometimes connecting narrowly across dorsal surface of neck;

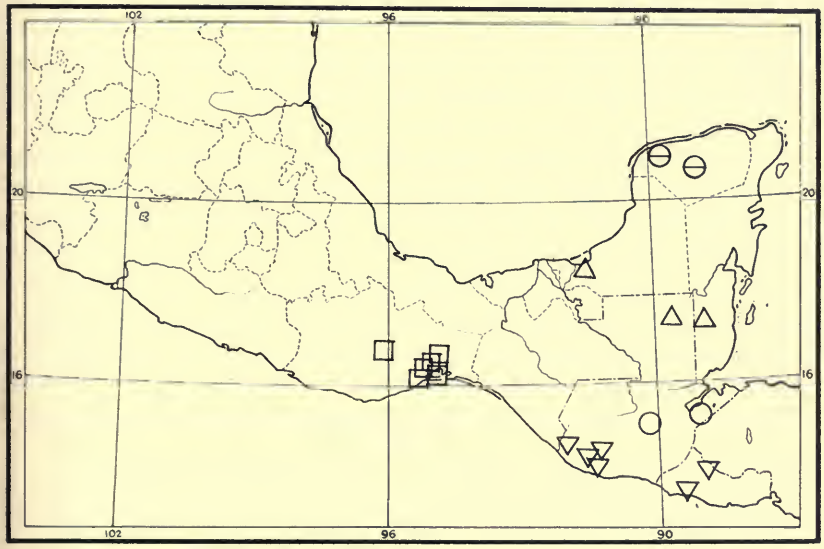

FIG. 8. Distribution of the primitive forms of the *spinosus* group: *Sceloporus acanthinus*, ▽; *S. lunaei*, ○; *S. lundelli lundelli*, △; *S. l. gaigeae*, ⊖; *S. edwardtaylori*, □.

females with narrow, undulate, dark gray bands across back; lateral blue patches on belly in males continuous across chest; middle of belly and chest dark blue; posterior surface of thigh mottled.

Description of type.—Head scales smooth, slightly convex, pitted; parietals single on either side; interparietal pentagonal, about two and one-half times as large as either parietal; frontoparietals single, in contact medially; five supraoculars, the anterior very small; fourth and fifth supraoculars broadly in contact with median head scales; one complete row of small scales between supraoculars and superciliaries; six superciliaries, five visible from above; median frontonasal in contact with frontal; two pairs of internasals; rostral

and internasals separated from rostral by four postrostrals; subnasal present, large; two canthals, normal in relationships with other scales, not touching lorilabials or forced above canthal ridge; preocular entire; lorilabials in two rows, reduced to one below subocular by contact of two scales with both subocular and supralabials; two postrostrals; four and one-half supralabials and infralabials to a point below middle of eye.

Mental pentagonal, with a labial border slightly less than two-thirds that of rostral; outer row of labiomentals narrowly separated from mental by partial contact of first postmental and first infralabial; four pairs of postmentals, the scales of the anterior pair in contact medially; gular scales notched, those toward posterolateral region with two apical notches; scales below ear keeled, rather strongly mucronate.

Auricular lobules three, subequal in size, their length somewhat greater than one-half the width of tympanum; auricular lobules slightly smaller than or subequal to preceding scales; temporal scales weakly keeled, mucronate, smaller than scales between ear and lateral nuchal pocket; latter scales weakly keeled, strongly mucronate, the mucrones recurving upward; these scales increasing in size dorsally, merging with dorsal body scales, greatly decreasing in size ventrally; scales immediately below and behind lower part of ear strongly keeled, strongly mucronate; scales between arm and lateral nuchal pocket subequal in size to scales anterior to nuchal pocket, weakly keeled, very strongly mucronate dorsally, weakly denticulate.

Dorsal scales weakly keeled (only toward apex), very strongly mucronate, very weakly denticulate, in slightly convergent rows; 32 dorsals from occiput to base of tail; scales around body 31; ventral scales 42; lateral scales more strongly keeled, mucronate and denticulate than dorsal scales, about two-thirds size of dorsal scales, in oblique rows; all ventral body scales, including preanals, with a single apical notch; median ventral scales about one-fourth size of dorsal scales.

Dorsal scales of foreleg keeled, mucronate, denticulate, about one-half size of dorsal scales on body; scales on anterior and antero-ventral surfaces of lower foreleg smooth, notched; other ventral scales of lower foreleg weakly keeled, mucronate; scales on ventral surface of upper foreleg smooth, with two apical notches, the scales increasing in size distally, the largest about two-thirds size of ventral scales of lower foreleg; lamellar formula for fingers 8–12–15–16–11 (8–12–16–17–11).

Dorsal scales of hind leg keeled, mucronate, not denticulate, somewhat larger than scales on foreleg; scales on anterior and ventral surface of thigh smooth, notched, smaller on ventral surface; femoral pores 10–11; scales on posterior surface of thigh keeled, denticulate, gradually increasing in size dorsally, the largest slightly smaller than preanal scales; ventral scales of shank smooth, denticulate, subequal in size to dorsal scales of same member; lamellar formula for toes 7–11–16–19–14 (6–11–15–19–15).

Dorsal caudal scales similar to dorsal scales on body; subcaudals smooth and denticulate at base of tail; no postfemoral dermal pocket; postanals enlarged in males.

Color.—In males the dorsal ground color more or less uniform olive-gray; a black spot, not light-bordered, in front of insertion of foreleg; two shoulder spots sometimes connected across dorsal surface of body by a poorly outlined gray band; very faint irregular darker markings on sides of body; toes faintly barred; a light spot in middle of interparietal, and sometimes one in the middle of each parietal.

Anterior part of gular region pale orange in large males, dusky white in smaller males; central and posterior part of throat iridescent greenish blue to darker cyanine blue, the edges or sometimes only the sides of the scales black or dark gray; shoulder patches sometimes (in large males) confluent across ventral surface; the scales in this region, if not entirely black, dark blue with black edges; a broad median area on chest and down abdomen dark blue, the chest scales black-edged; median blue area on abdomen becoming black in exact middle of belly; sides of belly lavender, the color extending onto sides of chest; groin colored like sides of body; ventral surfaces of limbs and tail cream-colored.

In females the dorsal ground color lighter than in males; no distinct black shoulder spot; a more or less distinct narrow neck band; about four narrow undulate dark gray bands across back, sometimes extending onto sides of body; a narrow irregular dark gray band extending posteriorly from near upper edge of lateral nuchal pocket to a point about one-third the distance between axilla and groin, where the band forks; both forks continuing posteriorly, paralleling each other, to groin; tail with indistinct dark gray bars; limbs with narrow dark bars. Throat dirty white, with scattered light-colored scales; a faint barring sometimes evident on throat; abdomen and ventral surfaces of limbs and tail dusky white, lighter than throat.

In both sexes, the posterior surface of the thigh is mottled, the white areas of larger size than the dark.

Variation.—The variation in cephalic scutellation of 18 specimens is as follows: two parietals on one side in one; frontoparietals single in all; frontal touches interparietal in eight, separated by an azygous scale in one, by contact of frontoparietals in eight; frontal entire in one, normal in others; five superciliaries in nine, six in eight; supraoculars four to six (4, six; 5, twenty-six; 6, two); frontal and median frontonasal in contact medially in 16, separated by an azygous scale in one; frontonasals normal in all; subnasal present in all; two canthals in all, the first in contact with lorilabials in one, never forced above canthal ridge; preocular divided on one side in one, on both sides in one; three postrostrals in one, four in others; lorilabials reduced to one row below subocular by one or more scales in contact with both subocular and supralabials on both sides in two.

Dorsal scales 28 to 34, average 31.9 (17 counts: 28, one; 29, one; 31, four; 32, six; 33, one; 34, four); ventral scales 38 to 45, average 40.6 (16 counts: 38, two; 39, three; 40, four; 41, three; 42, one; 44, two; 45, one); scales around body 30 to 36, average 33.3 (17 counts: 30, two; 31, one; 32, two; 33, three; 34, five; 35, two; 36, two). Femoral pores 9 to 12, average 10.6 (34 counts: 9, two; 10, fourteen; 11, fourteen; 12, four).

Comparisons.—*S. lundelli lundelli* is a form quite distinct, whose only close relative is *l. gaigeae*. It has a peculiar dorsal color pattern; the only species of the *spinosus* group with a similar pattern are *clarkii clarkii* and females of *stejnegeri*.

From *lunaei*, *lundelli lundelli* differs by having two canthals (one in *lunaei*); femoral pores usually fewer (12 to 17 in *lunaei*); dorsal scales average fewer (31 to 38, average 34.7, in *lunaei*); supraoculars larger, more regular; and color pattern different (two rows of spots down back in females of *lunaei*).

Habits and habitat.—The specimens collected at Balchacaj were all found on trees. Their gray coloration blends perfectly with the color of the trees on which they live. They are very cautious, moving very stealthily and quietly. They occur in the deepest parts of heavily wooded areas, as well as at the edges of woods, and may be seen on the few portions of the tree trunks or heavier limbs which are in the sun. Returning from a long tramp through the woods, I stopped for a rest underneath a relatively large tree at the edge of the woods, before starting the walk across the hot, open

savanna to the hacienda houses. After standing against the trunk a few moments, a snake's head protruding from a hollow limb caught my eye. I shot the snake, and at the same time disturbed a *lundelli* which was near the snake. After about ten minutes of close inspection of the tree, two other specimens were discovered and shot. For secretiveness they are paralleled in my experience only by *m. disparilis*. A few *s. serrifer* were taken in the region about Balchacaj, but appeared to be much more easily discovered, occurring only low on the trunks of the trees. Their more brilliant coloration makes them more conspicuous than *l. lundelli*.

Locality records.—CAMPECHE: Jaina (USNM 46862); Balchacaj (EHT 9945–55).

GUATEMALA: Uaxactun (MCZ 38665; UMMZ 70420–2).

BRITISH HONDURAS: Belize River at El Cayo (UMMZ 80675); Cohune Ridge (UMMZ 80674).

Sceloporus lundelli gaigeae subsp. nov.

Sceloporus malachiticus Cope, Proc. Amer. Phil. Soc., **22**, p. 397, 1885 (part); idem, Bull. U. S. Nat. Mus., **32**, p. 36, 1887 (part).

Sceloporus smaragdinus Günther, Biol. Cent.-Amer., Rept. Batr., pp. 88–89, 1890 (part).

Sceloporus serrifer Barbour and Cole, Bull. Mus. Comp. Zool., **50**, No. 5, p. 150, 1906.

Sceloporus acanthinus Gaige, Carnegie Inst. Wash. Publ., **457**, p. 297, 1936.

Type from Mérida, Yucatan. No. 31524 Field Museum of Natural History. Female. Collected by H. M. Smith.

Paratypes five, including two topotypes (E. H. Taylor Coll. 9942–3), and three from Chichen Itzá, Yucatan (FMNH 27332–4).

Distribution.—Northern part of the Yucatan Peninsula (fig. 8).

Diagnosis.—A *Sceloporus* of moderately large size, maximum snout-vent measurement 100 mm.; similar to *S. lundelli lundelli* in scutellation; no dorsal marks, or markings barely visible; shoulder spot not distinct; an indistinct narrow dorsal nuchal collar; a broad, light line on posterior surface of thighs.

Description of type.—Dorsal head scales smooth, pitted, not convex; a slight concavity in prefrontal and frontoparietal area; interparietal pentagonal; parietals single on either side, about one-half size of interparietal; frontoparietals more or less rectangular, single on each side, in contact medially; frontal typically divided; five large supraoculars on each side, the three posterior on each side completely in contact with median head scales; a short row of small

scales separating two anterior supraoculars from median head scales, and another row, nearly complete, separating supraoculars from all superciliaries except the first; six superciliaries, four visible from above; prefrontals separated by contact of frontal and median frontonasal; internasals irregular; four postrostrals; subnasal present, subequal in size to first canthal; two canthals, typical; preocular entire; loreal single; two strongly keeled postoculars; two irregular rows of lorilabials, reduced to one row below subocular by two scales in contact with both subocular and supralabial; four supralabials and five infralabials to a point below middle of eye.

Mental small, pentagonal, with a labial border slightly more than half that of rostral; three or four pairs of postmentals, the scales of only the anterior pair in contact medially; anterior scale of outer row of labiomentals separated from mental by partial contact of first infralabial and first postmental on each side; gular scales smooth, except those immediately below and behind ear, notched.

Four auricular lobules, the three upper subequal in size, not extending across ear opening, smaller than preceding scales; temporal scales weakly keeled, weakly mucronate, increasing in size posteriorly, the largest subequal in size to scales between ear and nuchal pocket; latter scales weakly keeled, strongly mucronate; a series of scales between nuchal fold and lower edge of ear, the scales strongly keeled, and mucronate; scales between nuchal pocket and arm weakly keeled, strongly mucronate, the largest somewhat larger than largest scales between ear and nuchal pocket.

Dorsal scales smooth at base, keeled apically, strongly mucronate, denticulate, in slightly convergent rows; lateral scales more strongly keeled, mucronate and denticulate than dorsal scales, about two-thirds or three-fourths size of dorsal scales; ventral scales smooth, each with a single apical notch, the median scales slightly smaller than lateral scales or scales on chest; preanal scales subequal in size to, and interfemoral scales slightly smaller than, median ventral scales; dorsal scales 29 from occiput to base of tail; scales around middle of body 32; ventral scales 40.

Dorsal scales of foreleg keeled, strongly mucronate, those on upper foreleg about one-half larger than those on lower foreleg, and about two-fifths size of dorsals on body; anterior ventral scales near hand keeled and mucronate; largest ventral scales of lower foreleg somewhat smaller than largest dorsal scales of same member; ventral scales of upper foreleg smooth or weakly keeled, weakly

denticulate, about one-third size of ventral scales on lower foreleg; lamellar formula for fingers 9–12–15–16–11 (8–11–13–15–11).

Dorsal scales of hind leg keeled, mucronate, not or weakly denticulate, those on shank somewhat larger than those on thigh, and about one-half size of dorsal body scales; scales on ventral surface of thigh smooth, some notched, some pointed, gradually increasing in size toward anterior surface of thigh; scales on posterior surface of thigh keeled, mucronate, not denticulate, subequal in size to interfemoral scales, slightly smaller than preanal scales; ventral scales on shank smooth, very weakly notched, subequal in size to dorsal scales of same member; lamellar formula for toes 6–10–16–19–13 (7–12–15–19–14).

Largest dorsal caudal scales somewhat smaller than largest dorsal body scales, similar in character; basal subcaudals smooth, pointed, the distal caudals becoming keeled, mucronate; no postfemoral dermal pocket; postanals enlarged in males.

Color (in alcohol).—Dorsal surface light olive-gray; head somewhat lighter than body; an oval light-colored pineal spot, its lateral edges defined by a narrow black line; two faint parallel narrow bluish lines passing from anterior temporal region posteriorly above ear to shoulder; no large shoulder spot; an indefinite dark bluish-black nuchal collar, broken medially by a narrow area about the width of one scale; limbs with very narrow cross bands; back practically uniform, with very faint evidence of crossbarring similar to the pattern in *l. lundelli;* two indefinite narrow and broken dark lines on sides of body, united above and behind axilla, extending forward from this point as a single line on each side to nuchal collar; tail faintly barred; ventral surfaces immaculate creamy white; infralabial region somewhat dusky.

A male of moderate size (85 mm. snout to vent) shows no evidence whatsoever of marks on the back; fingers and toes barred; tail not barred; nuchal collar narrow, complete, much broader in front of arm insertion; gular region and posterior part of throat dark blue, the scales in the gular fold region black-edged; anterior part of chest campanula blue; middle of chest and a narrow streak down middle of abdomen white; area adjacent to median white streak black, bordered laterally by a narrow iridescent greenish blue area, this bordered laterally by a broader campanula blue area; anterior part of throat dusky white, faintly tinged with pink (possibly light orange in life); ventral surfaces of limbs and tail white. In two male paratypes of larger size, the light ventral abdominal streak is confined

to the middle and posterior part of the belly. In one of the adult males, the anterior part of the gular region is bright tomato red, with a few indistinct light gray convergent bars.

A young female (62 mm. snout to vent) shows markings typical of *l. lundelli;* these markings are nearly or quite obsolete in all other specimens.

In both sexes, a broad longitudinal light line usually passes across the posterior surface of the thigh; the band is bordered below by a narrow dark line becoming indistinct distally, and above by the gray dorsal ground color of the thigh. In some specimens there are no marks on the posterior surface of the thigh.

Variation.—The cephalic scutellation of the eleven specimens studied varies from that of the type as follows: two parietals on both sides in two; frontal touches interparietal in six, separated by contact of frontoparietals in five; five superciliaries on one side in one; four supraoculars on both sides in two, five in eight, six in one; three postrostrals in one, four in others; two complete rows of lorilabials below subocular on both sides in six.

Comparisons.—The present subspecies differs from *l. lundelli* only in coloration, as stated in the diagnosis. The subspecies has long been confused with *s. serrifer*, from which it is quite different. There is no broad, light-bordered nuchal collar in *l. gaigeae* (always present in *serrifer*); some of the supraoculars are always in contact with the median head scales in *l. gaigeae*, usually not in *serrifer;* the frontal is in contact with the median frontonasal in *l. gaigeae* (rarely in *serrifer*). The two species occur together at Mérida, although inhabiting different ecological niches. Only *l. gaigeae*, so far as I am aware, has been taken at Chichen Itzá.

Habits and habitat.—Like *l. lundelli*, this subspecies seems to prefer trees. The specimens I collected at Mérida were found on large, light-barked trees. All the *s. serrifer* in this area were on stone fences and on buildings.

Locality records.—YUCATAN: (USNM 24875); Chichen Itzá (MCZ 7119, 29236; UMMZ 72880); Mérida (EHT 9942–4).

Sceloporus acanthinus Bocourt.[1]

Sceloporus acanthinus Bocourt, Ann. Sci. Nat., Zool., (5), 17, No. 6, p. [24], 1873.

[1] In the original description, the specific name is spelled *acathhinus*. However, in the index to the volume, the title of the paper describing the species is given with the name spelled *acanthinus*, and in the discussion of another species in a

Sceloporus acanthinus Bocourt, Ann. Sci. Nat., Zool., (5), **17**, No. 10, p. 1, 1873; idem, Miss. Sci. Mex., Zool., **3**, sec. 1, pp. 180–181, pl. 18, figs. 10, 10 *a*, 10 *b*, pl. 19, figs. 4, 4 *a*, 1874; Boulenger, Cat. Liz. Brit. Mus., **2**, pp. 217, 221–222, 1885; Cope, Bull. U. S. Nat. Mus., **32**, p. 37, 1887; Günther, Biol. Cent.-Amer., Rept. Batr., pp. 65–66, 1890 (part); Stejneger, N. Amer. Fauna, **7**, pp. 178, 180, 1893; Schaefer, Arch. Naturg., **68**, pp. 17, 21, 28–30, 34–36, figs. 10, 11, 1902 (femoral pore structure, cytology); Schmidt, Field Mus. Nat. Hist., Zool. Ser., **12**, pp. 193, 196, 1928.

Sceloporus torquatus Müller, Verh. Naturf. Ges. Basel, **6**, p. 633, 1878.

Sceloporus guentheri Stejneger, Proc. Biol. Soc. Wash., **31**, p. 92, 1918; Smith, Proc. Biol. Soc. Wash., **49**, p. 95, 1936.

Sceloporus acanthinurus Gadow, Jorullo, p. 66, 1930(?).

Type locality.—San Agustin, near Volcan de Atitlan, Guatemala.

Distribution.—El Salvador and the Pacific slopes of Guatemala, probably to be expected in adjacent Chiapas (fig. 8).

Diagnosis.—A moderately large *Sceloporus*, maximum snout-vent measurement 98.5 mm.; supraoculars large, four or five on each side, the posterior one or two frequently in contact with median head scales; a broad, dark, dorsal nuchal collar, sometimes narrowly interrupted medially; belly patches in males confluent medially, continuous across chest; two series of dark spots down back in females, faintly visible in males.

Description.[1]—Head scales rather strongly convex, smooth, pitted; interparietal subtriangular, about twice size of either parietal; parietal usually single on each side; frontoparietals single, rectangular, about three-fifths size of either parietal; frontal normal; supraoculars very large, not divided, usually five on each side; last two supraoculars usually broadly in contact with median head scales (occasionally all supraoculars separated from median head scales by a row of small scales); superciliaries six, five visible from above; one complete (rarely incomplete) row of small scales between supraoculars and superciliaries; prefrontals separated by an azygous scale; two or three pairs of internasals; nasals and internasals separated from rostral by usually four postrostrals; usually two canthals; subnasal present, large; usually one loreal; preocular usually entire, frequently divided; two postoculars; usually two rows of lorilabials complete below subocular, occasionally reduced to one row by one or more

later paper in the same column, *acanthinus* is referred to and spelled as in the index. Bocourt makes no mention in the Mission Scientifique (1874) of the misprint in the original description; the name is spelled, however, *acanthinus*. As it appears obvious that *acathhinus* is a misprint for *acanthinus*, I believe it permissible to retain the latter in place of the former, meaningless name.

[1] FMNH 20156, Tiquisate, Guatemala, is regarded as typical of *acanthinus*.

scales in contact with both subocular and supralabials; four supralabials and five infralabials to a point below middle of eye.

Mental pentagonal, with a labial border about three-fifths that of rostral; five or six pairs of postmentals, the scales of only the first pair in contact medially; outer row of labiomentals narrowly separated from mental by partial contact of first postmental and first infralabial; inner row of labiomentals terminating anteriorly near the anterior part of third infralabial; gular scales weakly notched, lateral scales larger than median; scales below ear keeled, mucronate, denticulate.

Auricular lobules four, smooth, rounded or pointed, variable in relative size, not reaching across ear opening (except upper scale sometimes), the largest subequal in size to preceding scales; temporal scales strongly keeled, the posterior ones strongly mucronate, all weakly denticulate, larger than scales between ear and lateral nuchal pocket; latter scales keeled, strongly mucronate, those surmounting crest of lateral nuchal fold very strongly keeled and mucronate; these scales somewhat smaller than scales between nuchal pocket and arm, which are more rounded in general outline. less strongly keeled, and more strongly denticulate.

Dorsal scales strongly keeled and mucronate, weakly denticulate, in slightly convergent rows, 31 to 38 from occiput to base of tail; lateral scales somewhat smaller than dorsals, less strongly keeled, more strongly mucronate; median ventral scales about half size of dorsal scales; ventral scales, including preanals, smooth, with a single apical notch; scales on chest slightly larger than those on middle of abdomen, latter subequal in size to or slightly larger than preanal scales.

Dorsal scales of foreleg keeled, mucronate, weakly denticulate, those on upper foreleg subequal in size to lateral body scales, nearly twice as large as dorsal scales of lower foreleg; ventral scales of lower foreleg smooth (except those at extreme posteroventral surface), rounded, somewhat smaller than dorsal scales of same member; ventral scales of upper foreleg smooth, weakly notched, gradually increasing in size toward elbow, the largest about two-thirds size of ventral scales of lower foreleg; lamellar formula for fingers 9–15–21–19–14 (9–13–17–18–14).

Dorsal scales of hind leg keeled, strongly mucronate, subequal in size to dorsal scales on upper foreleg; scales on anterior and ventral surfaces of thigh smooth, those on ventral surface notched, decreasing in size toward femoral pore series; 12 to 15 femoral pores on each side; scales on posterior surface of thigh keeled, mucronate, the largest

subequal in size to preanal scales; scales on ventral and concealed surfaces of thigh smooth, rounded or weakly notched, the smallest about two-thirds size of dorsal scales of same member; lamellar formula for toes 8–13–18–19–15 (8–12–17–20–15).

Dorsal caudal scales about one and one-third times as large as dorsal body scales, keeled, strongly mucronate; lateral caudals at base of tail more strongly keeled and mucronate; subcaudals smooth and notched or denticulate near base of tail, becoming keeled and mucronate distally; enlarged postanals present and distinct in males; no postfemoral dermal pocket.

Color.—Adult males bright olive-gray above, with a strong bluish tinge in certain lights; head lighter, with no bluish tinge; a broad, black collar, about two scales wide, sharply broken medially by a space two scales wide; two rows of indistinct spots faintly visible on dorsal surface of tail in younger specimens; limbs faintly barred in young. Specimens of moderate size have the neck somewhat darker than the back; occipital region of head suffused with dark gray, becoming brownish anteriorly; each of the median head scales with a more or less distinct white spot, usually placed centrally on each scale, these spots more distinct on posterior head scales than on anterior head scales.

Anterior gular region suffused with light yellow (in some specimens blue covers the entire throat); posterior part of gular region light methyl blue; gular fold region black, this color continuous with the black nuchal collar, which expands somewhat in front of arm; a broad area in middle of chest and down middle of abdomen (except a narrow area on abdomen some six scales wide posteriorly) navy blue or sailor blue, bordered laterally on abdomen by a narrow lilac or light lobelia violet area, and enclosing medially a narrow black area, which in turn encloses a narrow dusky-white area in posterior part of abdomen, these abdominal colors terminating posteriorly on a level with the groin, and not passing onto the groin; ventral surfaces of limbs and tail dusky-white.

Females yellow-brown to blue-gray above (in alcohol); neck band broad and distinct, as in males; back and sides with more or less irregular black markings, these tending to concentrate in crossbands; limbs and tail very distinctly barred; frontal, frontoparietal, parietals and interparietal dark-edged; throat with a bluish tinge; gular fold region dark gray in largest specimens; largest specimens show a slight trace of the lateral abdominal marks of males.

Two female specimens from Hacienda California, Guatemala (MCZ 28151–2) apparently have been in formalin a long time, with the nearly complete loss of all markings; the nuchal collar is barely visible.

Variation.—The variation in cephalic scutellation of 14 specimens is as follows: parietals two on each side in two; frontoparietal single on each side in all; frontal touches interparietal in nine, separated by an azygous scale in two, by contact of frontoparietals in three; superciliaries six in all; supraoculars three to five (3, one; 4, eleven; 5, sixteen); one or more supraoculars in contact with median head scales in 11; prefrontals in contact medially in one, separated by an azygous scale in ten, by contact of frontal and median frontonasal in three; median frontonasal separated from lateral frontonasals in one, normal in others; two canthals on one side in two, on both sides in six; preocular divided on one side in two, on both sides in three; loreals none (fused with subnasal) to two (0, one; 1, twenty-five; 2, two); lorilabials reduced to one row below subocular by contact of one or more scales with both subocular and supralabials on both sides in three.

Dorsal scales 31 to 38, average 35.7 (13 counts: 31, two; 34, one; 35, two; 36, two; 37, two; 38, four); ventral scales 37 to 46, average 42.4 (14 counts: 32, one; 34, two; 35, two; 36, three; 37, one; 38, two; 39, two; 40, one). Femoral pores 12 to 16, average 13.5 (28 counts: 12, three; 13, fourteen; 14, five; 15, five; 16, one).

Specimens from El Salvador have a low number of dorsal scales (31, 31) and a low number of scales around the body (32, 34, 34).

Habits and habitat.—Mr. Joseph R. Slevin states that *acanthinus* is typically found on trees and that he has no records of its occurrence at high elevations.

Locality records.—GUATEMALA: Hda. California (MCZ 28151–2); Olas de Moca, near Moca, Sololá (FMNH 20185; AMNH 38016); Tiquisate (FMNH 20156); Mazatenango (USNM 35672; CAS 68389–90); Los Patos River, Suchitepequez (CAS 68391, 71402); Volcan Zunil, Suchitepequez (CAS 71403–4); Pacific slopes (AMNH 38354); San Agustin, near Volcan Atitlan (Bocourt, 1874).

EL SALVADOR: San José del Sacaré, Dept. Chalatenango (FMNH 10970–1); Hda. Chileta, Dept. Sonsonate (FMNH 10991).

Sceloporus edwardtaylori Smith.

(?)*Sceloporus* sp. Cope, Proc. Acad. Nat. Sci. Phila., 1871, p. 216, 1871.
Sceloporus spinosus Gadow, Proc. Zool. Soc. Lond., 2, p. 194, 1905 (part).

Sceloporus edwardtaylori Smith, Herpetologica, **1**, pp. 6–8, 1936; Hartweg and Oliver, Occ. Papers Mus. Zool. Univ. Mich., **356**, pp. 7–8, 1937.

Type locality.—Ixtepec (San Gerónimo), Oaxaca. Type EHT 8331, collected by Edward H. Taylor and Hobart M. Smith.

Distribution.—Central and southern Oaxaca (fig. 8).

Diagnosis.—A large species, maximum snout-vent measurement 107 mm.; dorsal scales in parallel series, 28 to 33 from occiput to base of tail; ventral scales 36 to 44; femoral pores 9 to 13; supraoculars very large, the fourth always in contact with the median head scales, the third rarely not; series of scales between supraoculars and superciliaries absent or represented by an incomplete series of not more than four very small scales; last superciliary enlarged; median frontonasal seldom separated from frontal; lamellar formula for fourth toe 17 to 20; color above generally gray, with irregular dark markings; ventral surfaces practically immaculate except in young; males without distinctive ventral coloration.

Description of type.—Head quite thick and broad; parietals single, about one-third size of interparietal; frontoparietals single, separated

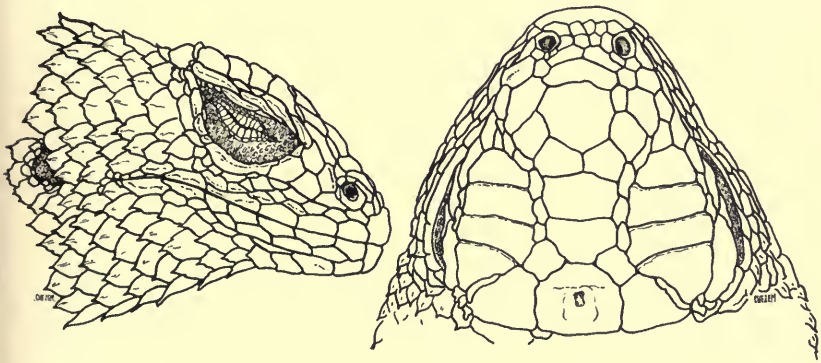

FIG. 9. Head scales of the type of *Sceloporus edwardtaylori.*

medially by contact of frontal and interparietal; posterior section of frontal about one-third size of anterior; anterior section abnormally divided; prefrontals single, widely separated by contact of median frontonasal and frontal; lateral frontonasals in contact with canthals; two canthals, both small; a very small subnasal; enlarged supraoculars four on each side, extremely large, partly separated from median scales by an incomplete row of small scales beginning at first superciliary and passing posteriorly to about the middle of the third supraocular, the scales becoming gradually smaller

posteriorly; a small scale at posterior edge of last supraocular; two very small scales between supraoculars and superciliaries; posterior superciliary very large, prominent; loreal present; preocular present, in contact with series of scales above supralabials; latter series double below supraocular, reduced to one anteriorly below loreal, the single row continuous around snout.

First pair of postmentals in contact, second pair separated; four supralabials to a point below middle of eye, and five infralabials to the same point; inner row of the two rows of scales intercalated between postmentals and infralabials narrowly separated from mental; latter with a labial border about two-thirds as great as that of rostral.

Three scales on anterior margin of ear, upper two larger, extending across tympanum, rounded; lower lobule acuminate, denticulate; lateral nuchal fold with large scales on anterior border, concealing fold; dorsal scales large, as broad as long or broader, 30 from interparietal to base of tail; dorsals weakly keeled, strongly mucronate, with three to five lateral mucrones; lateral scales as dorsals, except about one-half as large as dorsals; ventrals somewhat smaller than laterals, with one or two prominent notches.

Dorsal scales of upper foreleg somewhat smaller than lateral body scales, becoming smaller toward digits, all weakly keeled, mucronate and denticulate; ventral scales of foreleg averaging somewhat smaller than dorsal scales of same member, smooth, notched; axillary scales very small; lamellar formula for fingers 5–10–14–15–9.

Dorsal scales of hind leg like dorsals on body, but somewhat smaller than lateral body scales, those on shank and thigh subequal in size; ventral scales of hind leg somewhat smaller than dorsals, smooth, notched, those on foot smaller and keeled; scales on posterior surface smaller than preanals, keeled; femoral pores 11–11; lamellar formula for toes 6–11–15–17–12; dorsal caudals somewhat smaller than dorsals on body.

Color.—General color olive-gray, a few scales on back with a basal indistinct light blue area; keels black; a broad very indistinct slate-colored band from eye above ear to dorsal margin of insertion of hind leg, this band narrow until it reaches the foreleg, broadening posteriorly; below lateral dark band a light band, also indistinct, somewhat narrower, passing from upper labial region through ear onto shoulder and to groin; below this a narrow area of slate, very distinct as a black spot in front of foreleg, elsewhere very indistinct;

limbs more or less uniform, splashed irregularly with slate. Ventral surfaces immaculate, with a suffusion of light pearl blue (Ridgway) in the lateral abdominal areas and throat region. Tail faintly banded; a light, dark-edged pineal spot.

Variation.—The following data on variation of the head scales has been taken from 74 specimens, unless otherwise stated. Parietal single in all; two frontoparietals on one side in two; frontoparietals in contact medially in two, separated by an azygous scale in eight; frontal in contact with interparietal in 64; anterior section of frontal transversely divided in one; superciliaries six or seven (102 counts: 6, ninety-nine; 7, three); supraoculars four or five (when five, the anterior very small) (147 counts: 4, one hundred and thirty; 5, seventeen); supraoculars completely in contact with superciliaries or partially separated from them by one to four very small scales; two posterior supraoculars in contact with median head scales in 136 counts, the last only in five counts, next to the last only in two counts, and none in contact with median head scales in four counts; usually the posterior third or half of last supraocular and anterior half of third supraocular separated from median head scales; prefrontals in contact medially in one, separated by an azygous scale in two, by contact of median frontonasal with frontal in 70 (irregular in one); internasals usually in two pairs; postrostrals four in 51 counted; loreals one or two (102 counts: 1, ninety-five; 2, seven); two or three complete rows of lorilabials below subocular in all specimens (3 in one); preocular divided on one side in one; canthals usually two, fused on one side in one, on both sides in one; first canthal in contact with lorilabials on both sides in three, on one side in one; first canthal forced above canthal ridge by contact of second canthal and subnasal on one side in two, on both sides in one; outer row of labiomentals in contact with mental on both sides in two, on one side in one; auricular lobules usually three, rarely four, the upper two always larger than the lower.

Dorsal scales 28 to 33, average 30.2 (62 counts: 28, five; 29, fourteen; 30, sixteen; 31, eighteen; 32, eight; 33, one); ventral scales 36 to 44, average 39.5 (63 counts: 36, one; 37, ten; 38, twelve; 39, nine; 40, eleven; 41, eight; 42, eight; 43, three; 44, one); scales around body 30 to 37, average 32.8 (61 counts: 30, six; 31, six; 32, eleven; 33, twenty-two; 34, eight; 35, six; 36, one; 37, one). Femoral pores 9 to 13, average 11 (144 counts: 9, seven; 10, thirty-four; 11, sixty-one; 12, forty; 13, two); lamellae on fourth toe 15 to 20 (73 counts: 15, one; 17, fifteen; 18, thirty-six; 19, fourteen; 20, seven).

Habitat.—The specimens from Ixtepec and Totolapan were collected in semiarid localities, frequenting mesquite trees, large-stemmed yuccas, and the forms of *Opuntia* which reach large size.

Locality records.—OAXACA: Ixtepec (San Gerónimo) (EHT 8331–3; FMNH 1470[4]); Salina Cruz (AMNH 18448–51, 18001); Mixtequillo (AMNH 18541–8, 18550–4, 18584–5, 18766–8; CAS 73421–58); Juchitán (USNM 30389); San Mateo del Mar (USNM 46989); Totolapan (EHT 8311–30); city of Tehuantepec (MCZ 27086; AMNH 18039, 18555–7, 17962, 58051, 58270; UMMZ 81819–39[51]); Jalapa de la Marquesa (AMNH 4).

Sceloporus melanorhinus Bocourt.

Sceloporus melanorhinus Bocourt, Ann. Sci. Nat., Zool., (6), **3**, No. 12, pp. 2–4, 1876; idem, Jour. Zool., Paris, **5**, pp. 401–402, 1876; Sumichrast, Bull. Soc. Zool. France, **5**, pp. 163, 176, 1880; idem, Naturaleza, **5**, pp. 279–280, 1881; idem, **6**, p. 38, 1882; Boucard, Naturaleza, **7**, p. 314, 1885; Cope, Proc. Amer. Phil. Soc., **22**, pp. 395, 399, 1885; Boulenger, Cat. Liz. Brit. Mus., **2**, pp. 218, 225, 1885; Cope, Bull. U. S. Nat. Mus., **32**, p. 37, 1887; Günther, Biol. Cent.-Amer., Rept. Batr., p. 77, 1890; Boulenger, Proc. Zool. Soc. Lond., **1894**, pp. 723, 730–731, 1894; Dugès, Naturaleza, (2), **2**, p. 479, 1896; Boulenger, Proc. Zool. Soc. Lond., **1897**, pp. 475, 482–483, 1897; Cope, Ann. Rept. U. S. Nat. Mus., **1898**, pp. 337, 338, 1900; Gadow, Proc. Zool. Soc. Lond., **2**, p. 195, 1905; idem, Zool. Jahrb., Syst., **29**, 706, 1910; Stejneger, Proc. Biol. Soc. Wash., **31**, p. 92, 1918; Gadow, Jorullo, pp. 55, 65, 1930; Hartweg and Oliver, Occ. Papers Mus. Zool. Univ. Mich., **356**, p. 8, 1937; Taylor, Univ. Kans. Sci. Bull., **24**, p. 520, 1938.

Sceloporus clarkii boulengeri Burt, Trans. Amer. Micr. Soc., **54**, pp. 171–172, 1935 (part).

Type locality.—Isthmus of Tehuantepec.

Distribution.—Southern Nayarit to Oaxaca, along the Pacific coastal plain (fig. 10).

Diagnosis.—A large species, maximum snout-vent measurement 105 mm.; dorsal scales much larger than lateral scales, 27 to 33 from occiput to base of tail; ventral scales 44 to 54, average 49.5; femoral pores 17 to 24, average 19.5; four or five supraoculars, the last in contact with median head scales, all separated from superciliaries by a single row of small scales; outer row of labiomentals separated from mental; two dark bars across snout and top of head; females with large, more or less square blotches on back; sides of belly blue in males, the center of abdomen orange.

Description.[1]—Head scales smooth, pitted; interparietal pentagonal, about two and one-half times as large as either parietal;

[1] Based on EHT 8277, male.

prefrontals more or less square, in contact medially; frontal divided; posterior section of frontal pentagonal, slightly over one-half size of anterior section; latter shield-shaped; prefrontals in contact medially; three frontonasals, the median slightly more than twice the area of either lateral scale; a pair of broad scales in front of median frontonasals, which in turn is preceded by a row of three scales between the nasals; two small scales behind nasals; a small, square scale behind these, separating median frontonasal from anterior canthal; four large supraoculars on each side, preceded by one very small supraocular; all supraoculars except the last separated from the median head scales by a single row of small scales; a small scale placed at the outer posterior corner of last supraocular, between this scale and parietal; a single row of very small scales between supraoculars and superciliaries; six imbricating superciliaries on each side, the last not enlarged or protrudent; two canthals, normal in position, the posterior somewhat the larger; subnasal about half as large as loreal; nasal small, the nostril pierced near its posterior edge, leaving an anterior area about equal to area occupied by nostril; a single loreal; preocular single; subocular relatively short, heavily keeled, followed posteriorly by two heavily keeled postoculars; two rows of lorilabials, complete under subocular, below loreal reduced to one row which continues around snout; four supralabials and five infralabials to a point below middle of eye.

Mental triangular, its labial border three-fourths that of rostral; outer row of labiomentals separated from mental by partial contact of the first postmental and first infralabial; inner row of labiomentals terminating anteriorly on one side below the anterior half of the third infralabial, on the other side below the posterior half of the second infralabial; two pairs of well-differentiated postmentals, the scales of the anterior pair in contact medially; anterior gular scales rounded, about one-half or one-third size of posterior gular scales; latter scales with a single, weak apical notch; scales at sides of gular region, especially those near ear-opening, mucronate, denticulate, and very weakly keeled.

Temporal scales weakly keeled, mucronate and weakly denticulate, about three in number between postoculars and auricular lobules; auricular lobules four on each side, smooth, rounded, decreasing in size toward the ventral surface, the largest about half the size of preceding scales; scales between ear and lateral nuchal fold weakly keeled, mucronate, denticulate, subequal in size to or smaller than temporal scales.

Dorsal scales very weakly keeled, somewhat mucronate, in rows converging from above the arms toward the mid-dorsal line; lateral scales in oblique rows, about two-thirds or one-half size of mid-dorsal scales, slightly more strongly keeled; scales in axilla almost granular; scales in groin very small, imbricating; ventral abdominal scales smooth, with single apical notches, one-fourth or one-fifth size of mid-dorsal scales; scales on chest somewhat larger than abdominal scales; largest gular scales subequal in size to median ventral abdominal scales; preanal scales smooth, rounded or with apical notches, about one-half size of abdominal scales.

Dorsal scales of foreleg one-half or one-third size of dorsal scales on body, weakly keeled, mucronate and denticulate, the scales on lower foreleg somewhat smaller than those on upper foreleg; dorsal scales at elbow much reduced in size; ventral scales of foreleg smooth except near hand, rounded or notched, those on upper foreleg one-half or one-third size of those on lower foreleg; lamellar formula for fingers 8–13–16–18–12.

Dorsal scales of hind leg keeled, mucronate, those on thigh about one-third size of dorsals on body; dorsal scales of shank somewhat larger than those of thigh; ventral scales on shank somewhat larger than dorsal scales of same member; scales about knee and ankle greatly reduced in size; scales on anterior surface of thigh weakly keeled, mucronate, subequal in size to dorsal scales of same member, becoming smooth and smaller on ventral surface; scales in front of series of femoral pores subequal in size to preanal scales; scales on posterior surface of femur one-third larger than preanal scales, keeled, mucronate, abruptly decreasing in size towards series of femoral pores; lamellar formula for toes 8–12–20–21–16 (9–12–19–23–16).

Dorsal caudal scales near base of tail somewhat larger than or subequal in size to largest dorsal scales on body, keeled, mucronate; subcaudal scales keeled except at base of tail, mucronate, denticulate; enlarged postanal scales present, separated from each other by three small scales.

Color.—The coloration is very striking and most characteristic. The dorsal ground color is gray, sometimes quite light. The head has two very conspicuous broad dark bands—one across the snout, the other across the orbits and extending onto the nape of the neck or, in females, continuous on the back with a series of large indistinct dark gray rhomboidal blotches, about four in number. A distinct, broad light line passes from above the insertion of the foreleg

through the eye and across the head between the two dark bands, connecting with a similar band on the other side. Below this light band is a broad dark area, continuous with the black area on the tip of the snout, in males covering the whole ventral throat region, in females indistinct and not visible ventrally.

In males, there is a large median gular blue area or, in young males, the whole posterior part of the gular area is pale to cyanine blue. In some males a narrow area of greenish yellow is present at the angle of the jaws. The anterior part of the gular region is black, frequently with an irregular or cross-shaped white or orange spot near symphysis of mandibles. The chest is orange. The sides of the belly are greenish yellow laterally, followed medially by an area of pearl blue, and this in turn is bordered medially by a band of pale blue, becoming marine blue toward the middle of the belly. A narrow median abdominal band is orange. The ventral surfaces of the limbs and tail are cream.

In females, the sides of the belly are lemon yellow; a small indistinct blue spot may be present in the middle of the gular region.

Variation.—The following data on variation of head scales have been taken from 28 specimens. Parietals and frontoparietals single in all; anterior section of frontal longitudinally divided in three, posterior section transversely divided in one; frontoparietals in contact medially in 13, separated by an azygous scale in four; frontal in contact with interparietal in ten; superciliaries six in ten counted; supraoculars three to six (3, one; 4, eight; 5, thirty; 6, five); last supraocular only in contact with median head scales in 50 counts, last two in four; prefrontals in contact medially in 17, separated by an azygous scale in six, by contact of frontal and median frontonasal in four; usually two pairs of internasals; two canthals in all, first canthal touching lorilabials on both sides in one, on one side in three; first canthal forced above canthal ridge by contact of second canthal and subnasal on one side in two; preocular divided on both sides in six, on one side in one; loreals one to three (20 counts: 1, seventeen; 2, two; 3, one); postrostrals three or four (10 counts: 3, three; 4, seven); lorilabials reduced to one row below subocular by a single scale in contact with both subocular and supralabials on one side in one, two complete rows in others; outer row of labiomentals contacting mental in none; auricular lobules three to five, the upper largest and keeled, the lower ones smooth or weakly keeled.

Dorsal scales 27 to 33, average 28.9 (22 counts: 27, two; 28, nine; 29, five; 30, three; 31, two; 33, one); ventral scales 44 to 54, average

49.5 (22 counts: 44, one; 45, two; 46, one; 47, one; 48, four; 49, three; 50, three; 51, one; 53, three; 54, three); scales around body 31 to 40, average 34.4 (22 counts: 31, two; 32, one; 33, five; 34, four; 35, five; 36, two; 37, one; 38, one; 40, one). Femoral pores 17 to 24, average 19.5 (44 counts: 17, three; 18, fourteen; 19, ten; 20, six; 21, two; 22, seven; 23, one; 24, one).

The only obvious geographical trend in scale variation is in femoral pore count. The average in six counts of specimens from Tehuantepec is 22.5, while the average of 38 counts of specimens from Guerrero, Michoacán, and Colima is 19. The counts from Tehuantepec are: 22, four; 23, one; 24, one. The highest count of the other specimens is 22 in four, and 21 occurs only twice.

Habits and habitat.—I occasionally found these lizards on rocks or walls, and others have recorded them on cacti, but usually they were found on the trunks or larger branches of tall, light-colored trees, up which they would frequently climb beyond the range of .22 shot shells. Except for the conspicuous, dark-banded head, they blend almost perfectly with the light color of the trees, rocks, or walls which they frequent.

Locality records.—NAYARIT: San Blas (USNM 64667, 51384–9; AMNH 15895). JALISCO: (?)Guadalajara (USNM 24925–6). COLIMA: (USNM 31496); 3–5 mi. NW of Villa Alvarez (UMMZ 80068, 80071[4]); Hda. Gloria, 8 km. NW of Tecoman (UMMZ 80069); Hda. Paso del Rio (UMMZ 80070; EHT 8273A, 8271–8); Hda. Queseria (EHT 8267–70); Manzanillo (FMNH 1679; AMNH 15591); Colima (USNM 58159; AMNH 15647–53, 12761–2, 12750, 12742, 15589); 7 mi. E of Tecoman (AMNH 15646); La Quinta (AMNH 15583–4); San Cayetano (AMNH 15588); Tecoman (AMNH 12741, 12746); La Fundición (AMNH 12770–4); 1 mi. S of Balcon (AMNH 15585). MICHOACÁN: Hda. El Sabino (EHT 8279–99). GUERRERO: El Treinte (EHT 8300–1); Acapulco (EHT 8302–10; USNM 47732; WM sev.); Garrapata (EHT 8265); Tierra Colorada (WM 1; EHT 8263); Mescala (EHT 8264); Petatlan (LMK 10153); Zihuatenejo (LMK 7336); Tamarindo (USNM 47731). OAXACA: (MVZ 10330); Cerro de los tres Cruces, 32 km. SW of Tehuantepec (UMMZ 81817–8); Mt. Quiengola, 8 km. NW of Tehuantepec (UMMZ 81716); Juchitan (USNM 30390–4); Santo Domingo (USNM 47336); Tapanatepec (MCZ 39006); Cafetal Concordia, Pochutla (MCZ 33353–4); E of Santiago (AMNH 18406); Cafetal Alemania, one day from Pluma Hidalgo (AMNH 17999–18000).

The specimens which are stated to have been collected at Guadalajara are almost certainly incorrectly labeled. So far as I am aware, the species does not occur at elevations so great as that at Guadalajara (5,000 feet).

Sceloporus spinosus spinosus Wiegmann.

Sceloporus spinosus Wiegmann, Isis, **21**, p. 370, 1828; idem, Herp. Mex., p. 50, pl. 7, fig. 3, 1834; Fitzinger, Syst. Rept., **1**, p. 75, 1843; Müller, Reisen Ver. Staaten, Canada, Mex., **3**, p. 601, 1865; Peters, Monatsber. Akad. Wiss. Berlin, p. 874, 1869; Bocourt, Ann. Sci. Nat., Zool., (5), **17**, No. 6, p. [24], 1873; idem, Miss. Sci. Mex., Zool., **3**, sec. 1, pp. 174–176, pl. 18, figs. 2, 2*a*, 2*b*, 1874; idem, Ann. Sci. Nat., Zool., (6), **3**, No. 12, p. 3, 1876; idem, Jour. Zool., Paris, **5**, p. 402, 1876; Dugès, Naturaleza, **4**, p. 30, 1877; Müller, Verh. Naturf. Ges. Basel, **6**, pp. 573, 633, 1878; Cope, Proc. Amer. Phil. Soc., **18**, p. 265, 1879 (?); Yarrow, Bull. U. S. Nat. Mus., **24**, p. 63, 1883 (part); idem, Smithson. Misc. Collec., **517**, p. 10, 1883 (part); Garman, Bull. Essex Inst., **16**, p. 18, 1884; Cope, Proc. Amer. Phil. Soc., **22**, pp. 379, 395, 399, 1885; Boulenger, Cat. Liz. Brit. Mus., **2**, pp. 217, 226–227, 1885 (part); Ferrari-Perez, Proc. U. S. Nat. Mus., **9**, p. 193, 1886; Cope, Bull. U. S. Nat. Mus., **32**, p. 37, 1887; Dugès, Naturaleza, (2), **1**, pp. 205–206, 1889; Herrera, Naturaleza, (2), **1**, p. 332, 1890; Günther, Biol. Cent.-Amer., Rept. Batr., pp. 63–64, 1890 (part); Cope, Proc. Amer. Phil. Soc., **30**, p. 205, 1892; Stejneger, N. Amer. Fauna, **7**, pp. 178, 180, 1893; Herrera, Cat. Rept. Mus. Nac., Mexico, p. 18, 1895; Dugès, Naturaleza, (2), **2**, p. 479, 1896; Boulenger, Proc. Zool. Soc. Lond., **1897**, pp. 491, 494, 496, 1897 (part); Herrera, Cat. Rept. Mus. Nac., Mexico, 2nd ed., p. 18, 1904; Rosén, Ann. Mag. Nat. Hist., (7), **16**, p. 137, 1905; Gadow, Zool. Jahrb., Syst., **29**, p. 706, 1910; Camp, Bull. Amer. Mus. Nat. Hist., **48**, p. 410, 1923; Flower, Vert. Animals Zool. Soc. Lond., **3**, p. 89, 1929; Ph. Schmidt, Das Aquarium, **1931**, pp. 48–50, ill., 1931; Martin del Campo, Anales Inst. Biol., Mexico, **7**, pp. 273–274, fig. 1, 1936.

Tropidurus spinosus Wagler, Syst. Amph., p. 146, 1830.

Tropidolepis spinosus Gray, in Griffith, Cuvier's Animal Kingdom, **10**, [app.], p. 43, 1831; Duméril and Bibron, Erp. Gén., **4**, pp. 304–305, 1837; Gray, Cat. Liz. Brit. Mus., p. 209, 1845; Duméril and Duméril, Cat. Méth., p. 77, 1851; Lichtenstein, Nomen. Rept. Amph., p. 9, 1856; Jan, Cenni Rept. Mus. Milano, p. 37, 1857; Dugès, Naturaleza, **1**, p. 143, 1870; Westphal-Castelnau, Congr. Cient. France, **35**, p. 285, 1872.

Sceloporus horridus Bocourt, Miss. Sci. Mex., pp. 178–179, 1874 (part); Sumichrast, Naturaleza, **6**, p. 38, 1882 (part); Garman, Bull. Essex Inst., **16**, p. 17, 1884 (part); Cope, Proc. Amer. Phil. Soc., **22**, p. 396, 1885 (part); idem, Bull. U. S. Nat. Mus., **32**, p. 35, 1887 (part).

Sceloporus ferrariperezi Cope, Proc. Amer. Phil. Soc., **22**, p. 400, 1885 (part).

Sceloporus spinosus spinosus Martin del Campo, Anales Inst. Biol., Mexico, **8**, p. 262, 1937.

Type locality.—Mexico.

Distribution.—From southern Coahuila and Durango to northern Jalisco, Michoacán, Hidalgo, and Puebla on the Mexican plateau (fig. 10).

Diagnosis.—Dorsal scales 26 to 32, usually 30 or less, keeled, strongly mucronate, strongly denticulate, not abruptly differentiated from laterals; latter scales about two-thirds size of dorsals, somewhat

FIG. 10. Distribution of *Sceloporus melanorhinus*, ○; *S. spinosus spinosus*, ▽; *S. s. caeruleopunctatus*, △.

larger than ventrals, somewhat more strongly keeled, mucronate, and denticulate than dorsals; ventrals smooth, notched; preanal scales not smaller than median abdominals, much larger than scales on posterior surface of thigh; supraoculars large, in a single series, usually four in number, occasionally more; supraoculars usually completely separated from median head scales, and always separated from superciliaries, usually by one complete and another incomplete row of scales, occasionally by only one complete row; frontoparietals never in contact; prefrontals rarely in contact; femoral pores usually seven to ten. Throat rather strongly barred with blue on a light

background, in females, or with black on a blue background, in males; chest and a median abdominal streak always light-colored; sides of belly in males blue, not much darker medially; belly light in females. Dorsal markings consisting of undulate crossbars; no broad median dark streak developed in males.

Description.[1]—Head plates smooth or nearly smooth, convex, pitted; interparietal more or less pentagonal; parietals single on either side, about one-third size of interparietal; frontoparietals more or less square, single on each side, separated from each other medially by contact of interparietal and posterior section of frontal; latter about three-fifths size of anterior section of frontal; one pair of prefrontals, the scales separated from each other medially by contact of median frontonasal and anterior section of frontal; three frontonasals, the lateral scales in contact with both canthals on their respective sides; frontonasals and prefrontals subequal in size, the median frontonasal perhaps slightly larger than others; two pairs of internasals, the anterior pair separated from rostral by a row of scales continuous with lorilabials; both pairs of internasals separated from first canthal by a small scale; supraoculars four–four, the anterior smallest, the posterior largest or the third and fourth subequal in size, although differently shaped; a row of small scales completely separating supraoculars from median head scales; one complete and another incomplete row of small, keeled scales separating supraoculars from superciliaries, except for the anterior supraocular, which is in contact with the first superciliary; five superciliaries visible above; two canthals, normal in position and relationships on one side, on the other side the first canthal narrowly contacting lorilabials; subnasal present, moderate in size; one loreal, square; preocular not divided; subocular relatively short, followed posteriorly by two keeled postoculars; two rows of lorilabials, not reduced below subocular; four supralabials and five infralabials to a point below middle of eye.

Mental relatively small, pentagonal, with a labial border about half that of rostral; two pairs of well-differentiated postmentals, the scales of the anterior pair in contact medially, the scales of the posterior pair separated medially by two small scales; outer row of labiomentals separated from mental by partial contact of first postmental and first infralabial; inner row of labiomentals terminating anteriorly below the anterior part of the third infralabial; gular scales smooth, with one or two (usually one) apical notches (notches

[1] Based on EHT 8431, male.

absent on anterior scales); gular scales on median ventral line distinctly, although not greatly, smaller than lateral gular scales; lateral gular scales below ear not keeled; scales in gular fold region with two to three apical notches (usually two).

Auricular lobules three, the upper very large and extending beyond posterior edge of ear opening; auricular lobules smooth, acuminate, the upper considerably larger than preceding scales; temporal scales keeled, weakly mucronate, smaller than scales between ear and nuchal fold; scales between ear and lateral nuchal fold weakly keeled, very strongly mucronate, strongly denticulate; ridge of skin overlapping lateral fold with enlarged, strongly mucronate, keeled scales which continue in an irregular row to lower margin of ear; scales between lateral nuchal fold and arm somewhat smaller than preceding scales, weakly keeled, strongly mucronate, and strongly denticulate.

Dorsal scales keeled, strongly mucronate, strongly denticulate, in parallel rows, smaller near occiput; median lateral scales slightly smaller than dorsal scales, keeled, strongly mucronate and denticulate, in oblique rows, smaller toward axilla and groin; ventral scales smooth, with a single apical notch (some on chest with two apical notches), one-half or two-fifths size of dorsal scales; scales on chest somewhat larger than scales on belly, subequal in size to lateral gular scales; preanal scales notched, smaller than scales on belly, a few somewhat pore-like; interfemoral scales intermediate in size between scales in preanal area and those on belly; scales on rump somewhat smaller than dorsal scales on body; basal caudal scales on dorsal surface nearly as large as dorsal scales on body, somewhat more strongly keeled, strongly mucronate, weakly denticulate, decreasing in size distally; basal subcaudals smooth, notched, becoming acuminate and weakly keeled toward tip of tail; enlarged postanals present, separated medially by two small scales.

Scales on dorsal surface of foreleg keeled, mucronate, those on upper foreleg distinctly larger than those on lower foreleg and about one-half size of dorsal scales on body; scales on elbow reduced in size; ventral scales of lower foreleg somewhat smaller than dorsals of same member, smooth anteriorly, keeled posteriorly and toward hand; scales in axilla very small, not granular, the scales becoming somewhat larger on ventral surface of upper foreleg; scales in latter area smooth, notched; lamellar formula for fingers 8–12–16–16–10.

Dorsal scales of hind leg rather strongly keeled, strongly mucronate, weakly denticulate, those on thigh subequal in size to dorsal

scales of upper foreleg, those on shank somewhat larger; scales on knee reduced in size; ventral scales of shank smooth, acuminate, distinctly smaller than dorsal scales of same member; scales on anterior surface of thigh smooth or weakly keeled, mucronate, denticulate, becoming entirely smooth, notched and smaller toward femoral pore series; all scales on posterior surface of thighs distinctly smaller than scales in preanal area, those in a central area the largest, keeled, mucronate; no postfemoral dermal pocket; lamellar formula for toes 9–13–17–21–15.

Color.—Males brownish above; a dorsolateral light line passing from posterior corner of eye to base of tail; a dark line below dorsolateral line, fading on sides of body toward venter, this dark line broken by narrow indistinct light bars; broader dark bars across back, separated by narrow broken light bars, bluish in color, each usually represented by one to three single blue-colored scales; labia distinctly barred; a large black spot on shoulder, with a small blue spot in it; two narrow light bars across top of head, one crossing posterior section of frontal, the other crossing prefrontals; foreleg with fairly distinct darker bars, more distinct distally; hind limbs faintly banded; tail with indistinct darker bands.

A large area in middle of throat dark blue; lower labial region tinged with orange, and with narrow black or dark blue bars converging toward median blue spot on middle of throat; chest with a few dark streaks; sides of belly iridescent pale blue, becoming black toward middle of abdomen; a narrow band down middle of abdomen, cream-colored; preanal and interfemoral regions and ventral surfaces of limbs cream-colored; ventral surface of tail tinged with blue, sometimes fading to white or cream color in middle; black borders of lateral belly patches not extending into groin; black shoulder patch confluent with dark blue area in middle of gular region.

Females in general much like males above. General ground color olive; lines across top of head absent or indistinct; dark bars across back narrow, with wide lighter interspaces; these bars sometimes broken medially, producing two series of dark spots on each side of back; dorsolateral light line less distinct; dark line below this distinctly broken into a series of small spots or transverse bars fading ventrally; lower labial region tinged with orange, barred, the bars converging toward middle of throat, but not fusing; no blue patch in middle of gular region; irregular streaks present on abdomen and chest, the most regular a broken median ventral line; limbs banded as in males.

In young males the gular blue patch is poorly developed, and the dorsal and lateral markings resemble those of the females.

Variation.—The following data on variation in scutellation of the head have been taken from 52 specimens. Frontal in contact with interparietal in 50, separated by an azygous scale in two; frontoparietals divided on both sides in nine, on one side in two; anterior section of frontal longitudinally divided in six; superciliaries rarely five, usually six; prefrontals in contact medially in six, separated by an azygous scale in 33, by contact of frontal and median frontonasal in 13; supraoculars four to six (168 counts: 4, one hundred and thirty-six; 5, thirty-three; 6, five); supraoculars usually completely separated from median head scales, the last narrowly in contact in 13, the last two narrowly in contact in one; always at least one complete row of small scales separating supraoculars from superciliaries, and another incomplete row usually present (absent on both sides in 11, on one side in three, of 38 counted); internasals usually in two pairs, the last pair occasionally represented by three scales; first canthal forced above canthal ridge by contact of second canthal and subnasal in five specimens; first canthal in contact with lorilabials on both sides in two, on one side in three; preocular divided on both sides in eight, on one side in four; lorilabials usually in two complete rows below subocular, reduced to one row by a scale contacting both subnasal and infralabials on both sides in seven, on one side in three; outer row of labiomentals in contact with mental on both sides in six, on one side in one; auricular lobules three to six, usually four, the upper the largest, smooth, nearly or completely extending across ear.

Dorsal scales 26 to 32, average 28.7 (67 counts: 26, three; 27, nine; 28, thirteen; 29, twenty-six; 30, fourteen; 31, one; 32, one); ventral scales 40 to 50, average 43.6 (30 counts: 40, three; 41, three; 42, six; 43, five; 44, two; 45, four; 46, three; 47, two; 48, one; 50, one); scales around body 31 to 41, average 35.7 (30 counts: 31, one; 32, one; 33, one; 34, four; 35, twelve; 36, three; 37, two; 38, two; 39, two; 40, one; 41, one). Femoral pores 6 to 12, average 8.6 (236 counts: 6, two; 7, twenty-nine; 8, eighty-six; 9, seventy-three; 10, forty; 11, five; 12, one).

The single specimen with six–six femoral pores was collected at Acultzingo, Vera Cruz; one specimen with 10–11 pores was collected in southern San Luis Potosí (Villa de Guadelupe).

Relationships.—It has been generally considered that *horridus* is a subspecies of *spinosus*. I have found no evidence in favor of this assumption. All evidence available at present indicates that the two

do not intergrade. The only place, so far as I am aware, that intergradation could take place is in the upper valley of the Balsas River. However, specimens from Tehuacán, Puebla, are typical *spinosus spinosus*, while specimens in northern Oaxaca, nearer the Rio Balsas, are typical *horridus horridus*. The two species have possibly been collected at one locality in Puebla (city of Puebla).

Farther north, the elevated western edge of the plateau forms an effective barrier. I am certain that neither crosses the Sierra between Cuernavaca and Mexico City. It appears that as far north as Uruapan, *horridus oligoporus* extends its range up onto the plateau some distance, but there is no doubt of the distinctness of *horridus oligoporus* and *spinosus spinosus*, as the former has reduced its femoral pore count to a maximum of four. The other character of importance in separating *horridus* from *spinosus* (contact of last supraocular with median head scales in the former) shows no tendency toward intergradation at any point of contact or proximity of the ranges of the two species. Occasional specimens with the supraoculars completely separated from the median head scales occur throughout the range of *horridus;* similarly, specimens of *spinosus* occasionally have the last supraocular in contact with the median head scales.

Habits and habitat.—Specimens I have observed seemed to show a preference for somewhat arid conditions. They were frequently observed on the ground, taking refuge in the nests of wood rats when alarmed. Others have been collected on *Opuntias*.

Dugès (1889, p. 206) states: "Frequently it is attacked by a red mite in the larval or adult state which lodges itself between the scales of the flanks, axillae and sides of the neck; I have described it with the name *Geckobia oblonga* (Bull. Soc. Zool. France, 1888). This lizard does not run with much speed; it is principally found in rocky places; like all its congeners, it bites, though feebly; it feeds on all kinds of insects. In June, July, and August the females contain eggs already fertilized, which can be as numerous as 50 or 60; I do not know where they are laid."

Locality records.—DURANGO: (USNM 23990–1, 24001–2); Durango (USNM 47352; FMNH 1282–3). ZACATECAS: Berriozabal (USNM 47040). SAN LUIS POTOSÍ: Charcas (UMMZ 77273); San Diego (UMMZ 77272[10]); Jesus Maria (USNM 47232); Morales (MCZ 20030, 20032); Soledad (MCZ 20026–7); Alvarez (MCZ 28218); Hda. de Coronado (EHT 8448); 4 mi. S of Villa de Guadelupe (EHT 8445–7, 8455); 3 mi. N of El Salado (EHT 8447A). TAMAULIPAS: Miquihuana (USNM 47635; MCZ 17483–6, 20035–6). JAL-

ISCO: Lagos (USNM 47038, 46873); 5 mi. N of Teocaltiche (EHT 8395–8, 8456). AGUASCALIENTES: (FMNH 1657); 8 mi. S of Aguascalientes (EHT 8394). GUANAJUATO: (USNM 11362; LSJU 3843, 5279); El Terrero (EHT 8452); San Felipe (EHT 8449–51); Acámbaro (USNM 47216–7; EHT 8437–44); Huasteca Potosina (Dugès, 1889). HIDALGO: Tula (USNM 47727); Zimapán (USNM 47782–3); Ixmiquilpan (USNM 47781); 11 mi. S of Ixmiquilpan (EHT 8457–8); 35–40 mi. S of Jacala (EHT 8416); 56 mi. N of Pachuca (EHT 8390, 8415); Santa Maria, N of Pachuca (EHT 8391); Actopán (Martin del Campo, 1936); Matilde (MCZ 19725). VERA CRUZ: 1½–2 mi. W of Acultzingo (EHT 8417–26, 8460–1); Maltrata (USNM 46821–2). MEXICO: El Tajo de Tequixquiac (MVZ 8851; AMNH 15512). DISTRITO FEDERAL: N of Guerrero in Guadelupe hills (AMNH 18418–9); Morelos road to Santa Fe (AMNH 17969). MICHOACÁN: (USNM 9867); Tupátaro (USNM 10245, 10233); 3 mi. N of Maravatio (EHT 8432–6). PUEBLA: Atlixco (USNM 47035); Tehuacán (USNM 47770–1, 47728; EHT 8431; WM 4); Puebla (FMNH 1325; AMNH 17989, 17991–3, 18790–4); 10 mi. N of Tehuacán (EHT 8427–30, 8462–3); Alseseca (EHT 8459); Santa Catarina (AMNH 18701–5, 18567–81, 18844–52); Laguna de los Reyes, Santa Catarina (AMNH 18796–803); between Orizaba and Tehuacán (WM 2); 15 mi. E of San Marcos (EHT 8392); Tlapanalá (Izucar de Matamoros) (Cope, 1885).

Sceloporus spinosus caeruleopunctatus Smith.

Sceloporus spinosus caeruleopunctatus Smith, Kans. Univ. Sci. Bull., **24**, pp. 469–473, 1938.

Type locality.—Cerro de San Luis, 15 miles north of Oaxaca, Oaxaca. Type EHT 8467, collected by H. M. Smith.

Distribution.—Highlands of central Oaxaca (fig. 10).

Diagnosis.—Similar to *s. spinosus*, except dorsal scales usually more than 30 (28 to 37); femoral pores usually more than nine (eight to 14); supraoculars usually five to seven, rarely four.

Description of type.—Head scales smooth, slightly convex, pitted; interparietal pentagonal; parietals single on either side, about two-thirds size of interparietal; frontoparietals single on either side, more or less square, separated from each other medially by contact of frontal and interparietal; posterior section of frontal three-fourths or four-fifths size of anterior section; prefrontals in contact medially; three frontonasals, the lateral scales in contact with both canthals, median frontonasal distinctly larger than lateral frontonasals, and

slightly larger than prefrontals; two pairs of internasals, the anterior pair separated from the rostral by a row of scales continuous with lorilabials; both pairs of internasals separated from first canthal by small scales; supraoculars five–five, the anterior the smallest, the fourth slightly larger than others; a single, complete row of small, usually keeled scales separating supraoculars from median head scales; one complete and one incomplete row of scales separating supraoculars from superciliaries (except the first supraocular, which is in contact with first superciliary); five superciliaries visible from above; two canthals, the first not touching lorilabials nor forced above canthal ridge, the second forming a small portion of the superciliary series; subnasal present, approximately size of first canthal; loreal present, more or less square; preocular entire; subocular moderate in size, followed posteriorly by two small, strongly keeled postoculars; lorilabials in two rows, not reduced to one below subocular (usually reduced to one row); supralabials four, infralabials five–six to a point below middle of eye.

Mental pentagonal, with a labial border about three-fifths that of rostral; mental followed posteriorly by three pairs of postmentals, the scales of only the anterior pair in contact medially; outer row of labiomentals separated from mental by partial contact of first postmental and first infralabial; inner row of labiomentals terminating below third infralabial; gular scales smooth, with one or two apical notches (usually one); anterior gular scales rounded, reduced in size; posterior gular scales subequal in size; gular scales below ear weakly keeled; scales in gular fold region with one to three apical notches.

Auricular lobules three, the upper the longest, but not reaching across ear; auricular lobules larger than preceding temporal scales; temporal scales weakly keeled, weakly mucronate toward eye, more strongly toward ear, somewhat smaller than largest scales between ear and lateral nuchal pocket; ridge of skin overlapping lateral nuchal pocket surmounted by strongly keeled, very strongly mucronate scales, which continue in an irregular row to a point below ear; scales between ear and insertion of foreleg keeled, rather strongly mucronate, strongly denticulate.

Dorsal scales keeled, rather strongly mucronate, denticulate, in parallel rows, the scales toward occiput reduced in size; median lateral scales of somewhat the same general character as the dorsal scales, somewhat smaller than dorsal scales, somewhat more strongly keeled, in oblique rows; lateral scales toward axilla and groin becoming smaller, those in axilla almost granular, those in groin one-half

as large as median lateral scales, imbricating; ventral scales about one-half or three-fifths size of dorsal scales; scales on chest slightly larger than those on belly; interfemoral and preanal scales not or very slightly smaller than scales on belly; some of preanal scales rather pore-like; all ventral scales smooth, with a single apical notch; dorsal scales on rump very slightly reduced in size; basal caudals on dorsal surface as large as largest dorsal scales on body; dorsal caudals strongly keeled, strongly mucronate, not or weakly denticulate, becoming smaller and more strongly keeled toward tip of tail; subcaudals smooth, rounded, becoming keeled distally; enlarged postanals present, separated medially by two small scales.

Dorsal scales of foreleg keeled, mucronate, denticulate, those on upper foreleg about one-third size of dorsal scales on body, somewhat larger than those on lower foreleg; scales at elbow reduced in size; ventral scales of lower foreleg about as large as dorsal scales of same member, keeled except at extreme anterior edge; ventral scales on upper foreleg smooth (keeled anteriorly), usually notched, about one-half or two-thirds size of ventrals of lower foreleg, becoming smaller near axilla; lamellar formula for fingers 8–12–16–16–9 (8–12–16–16–10).

Dorsal scales of hind leg rather strongly keeled, mucronate, weakly denticulate, those on thigh somewhat larger than those on upper foreleg; dorsals on shank somewhat larger than those on thigh; ventral scales of shank smooth, notched, as large as dorsal scales of same member; scales on anterior surface of thigh nearly smooth, acuminate, with a single notch on either side of apex, the scales becoming quite smooth, with a single apical notch, and much smaller toward series of femoral pores; scales in a median area on posterior surface of femur keeled, mucronate, much smaller than preanal scales; no postfemoral dermal pocket; lamellar formula for toes 8–13–16–19–12 (8–13–17–19–12).

Color.—General dorsal coloration brownish yellow, a dorsolateral light line on each side, about one and one-half scales wide, extending from temporal region onto base of tail; below this the ground color is darker, sometimes concentrated into broad indistinct dark bars separated by narrow lighter areas, not passing onto ventral surface of abdomen; between the dorsolateral light lines are a number of dark blue scales (the color usually fades in preservative) apparently arranged in two irregular rows; the heads of the two males are slate (rather dark in type), with numerous white flecks; among these the most distinct are a light spot on each parietal, a light pineal spot

with a small dark central spot, a light spot on each side at the posterior edge of interparietal, a light spot on each frontoparietal, a light narrow bar across posterior section of frontal, and a light spot at the posterior medial edge of the third supraocular; in the males an indefinite brownish band crosses the head in front of the eyes and is preceded by a darker brown area extending to the internasals; the internasal area, to the rostral, is light brown; the labia are irregularly marked with dark and very light brown; a dark spot is in front of the arm, extending dorsally a short distance, with a few scales of dark blue color; the black shoulder spots are narrowly continuous with each other across neck; in the type, the anterior part of the gular area is white, the posterior part blue; in the male paratype, the whole throat is dark blue; in both specimens black or dark blue convergent bars are present in the gular region; the chest, a narrow area down middle of abdomen, preanal region and the posterior part of the ventral surface of the thighs are white; on each side of the belly is a broad area of blue, bordered medially by a narrow area of black or dark blue; the groin is black or dark blue, the color extending onto the thighs; the chest has a few irregular spots of black.

In the females two rows of irregular dark brown spots are present between the dorsolateral light lines; the throat has indistinct bluish bars, and the sides of the abdomen have a bluish tinge.

The following notes from my field catalogue are from living specimens: "*Large male:* Lighter parts of labial region and lighter parts of back tinged with reddish orange, more distinct on head. Posterior gular region dark blue; sides of belly lighter, tinged with light green. Some of the scales of the back between the dorsolateral light lines dark blue. *Smaller male:* Lacks orange color of head. *Female:* In life, when shot, the blue spots on the back were very distinct. A few hours later, before preservation, the color had disappeared."

Variation.—The variation in the cephalic scutellation, except of the supraoculars, is essentially the same as in *s. spinosus*. The two differences pointed out in the description (reduction of lorilabials to one row below subocular, medial contact of prefrontals) do not hold in larger series. The supraoculars vary in number between four and six, averaging 5.1 (145 counts: 4, five; 5, one hundred and twenty; 6, nineteen; 7, one).

Dorsal scales 28 to 37, average 32.6 (75 counts: 28, two; 29, three; 30, two; 31, thirteen; 32, eighteen; 33, sixteen; 34, ten; 35, five; 36, three; 37, three); ventral scales 42 to 52, average 46.1 (20 counts: 42, one; 43, three; 44, three; 45, two; 46, two; 47, three; 48, two; 49, one;

51, one; 52, two); scales around body 37 to 45, average 39.1 (22 counts: 37, two; 38, three; 39, seven; 40, three; 41, one; 42, four; 43, one; 45, one). Femoral pores eight to 14, average 11 (151 counts: 8, eleven; 9, eight; 10, twenty-nine; 11, forty-five; 12, thirty-seven; 13, seventeen; 14, four).

The following table summarizes the differences in scutellation between *s. spinosus* and *s. caeruleopunctatus*.

s. spinosus	Per cent	*s. caeruleopunctatus*	Per cent
Supraoculars 4	80.9	Supraoculars 5 or more	96.6
Dorsals 30 or less	97.0	Dorsals 31 or more	90.7
Pores 9 or less	80.5	Pores 10 or more	87.4

Specimens of *s. spinosus* from the vicinity of the city of Puebla show no tendency toward *horridus horridus*. The femoral pore counts vary (in nine specimens) between seven and 12 (7, one; 8, four; 9, ten; 10, two; 12, one). The dorsal scales are 30 in one, less in the others. The average number of supraoculars shows a tendency toward that of *s. caeruleopunctatus* (one-third of the counts are five, the remainder four). Specimens from the vicinity of Los Reyes, Puebla (17) show no tendency either toward *h. horridus* or *s. caeruleopunctatus*.

Specimens of *s. caeruleopunctatus* from Miahuatlan, Oaxaca, have a smaller average number of dorsals and femoral pores than is typical; the supraoculars are normal for the subspecies (20 counts: 4, two; 5, eighteen). The dorsals are: 28, two; 29, two; 30, two; 32, three; 33, one. The femoral pores are: 8, eleven; 9, three; 10, one; 11, five.

Habits and habitat.—Specimens collected near Oaxaca, Oaxaca, were found running about on the ground at low elevations, in more or less open areas, usually near rocks. They always ran into rock piles or bushes at the first indication of danger, and were rather difficult to collect.

Locality records.—OAXACA (AMNH 18019); Miahuatlan (AMNH 18822–6, 18721–5); Miahuatlan to Ejutla (AMNH 18598–9); Tlacolula to San Pablo Mitla (AMNH 18804–14); Cerro de San Luis, 15 mi. N of Oaxaca (EHT 8464–7); Oaxaca (AMNH 18587–97, 18753–65, 18827–43; FMNH 1011; USNM 47396–8, 47534–5, 47592).

Sceloporus horridus horridus Wiegmann.

Sceloporus horridus Wiegmann, Herp. Mex., p. 50, 1834; Fitzinger, Syst. Rept., 1, p. 75, 1843; Duméril, Arch. Mus. Hist. Nat. Paris, 8, p. 547, 1856; Müller, Reisen Ver. Staaten, Canada, Mex., 3, p. 601, 1865; Bocourt, Miss. Sci. Mex., Zool., 3, sec. 1, p. 178, pl. 18, fig. 8, 1874; Dugès, Natura-

leza, **4**, p. 30, 1877; Sumichrast, Naturaleza, **6**, p. 38, 1882 (part); Stejneger, N. Amer. Fauna, **7**, p. 182, 1893; Cope, Amer. Nat., **30**, p. 1024, 1896; Dugès, Naturaleza, (2), **2**, p. 480, 1896; Stejneger, N. Amer. Fauna, **14**, p. 67, 1899; Gadow, Through Southern Mex., p. 220, 1908.

Tropidolepis horridus Duméril and Bibron, Erp. Gén., **4**, p. 306, 1837; Gray, Cat. Liz. Brit. Mus., p. 209, 1845; Duméril and Duméril, Cat. Méth., p. 77, 1851; Westphal-Castelnau, Congr. Scient. France, **35**, p. 285, 1872.

Sceloporus spinosus horridus Boulenger, Cat. Liz. Brit. Mus., **2**, p. 227, 1885 (part); idem, Proc. Zool. Soc. Lond., **1897**, pp. 491, 493–495, 1897 (part); Ahl, Zool. Anz., **106**, p. 184, 1934.

Sceloporus spinosus Günther, Biol. Cent.-Amer., Rept. Batr., pp. 63–64, 1890 (part); Gadow, Proc. Zool. Soc. Lond., **2**, p. 194, 1905 (part).

Type locality.—Mexico.

Distribution.—Southern Morelos, eastern Guerrero, Oaxaca in the Balsas Basin, southern Puebla (fig. 11).

Diagnosis.—A moderately large species, maximum snout-vent measurement about 113 mm.; cephalic scales smooth; dorsal scales 28 to 34 from occiput to base of tail, keeled, mucronate, denticulate; supraoculars usually four in number (rarely five), the fourth almost always in partial contact with median scales; superciliaries

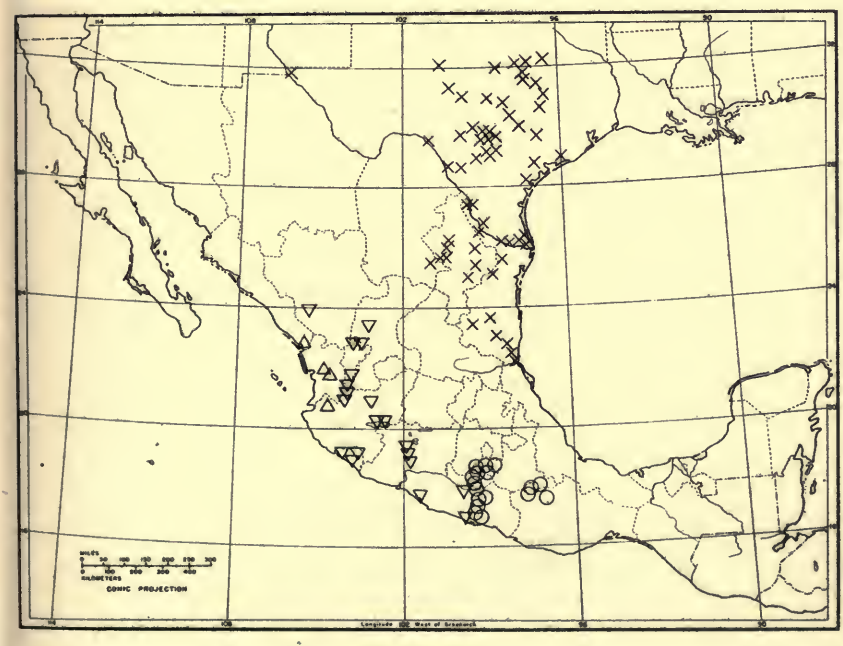

FIG. 11. Distribution of *Sceloporus horridus horridus*, ○; *S. h. oligoporus*, ▽; *S. h. albiventris*, △; and *S. olivaceus*, ×.

separated from supraoculars by a single row of small scales; frontal usually contacting the interparietal; prefrontals in contact medially in 30.6 per cent; preocular entire on one or on both sides in 82.4 per cent; lorilabials almost always in two complete rows below subocular; outer row of labiomentals rarely contacting mental; auricular lobules irregular, small; femoral pores on each side three to six, usually four or five, rarely six, totaling on both sides usually seven or more. Males with sides of belly blue, black, or dark blue bordered; gular region blue in males, black or dark blue barred; females with narrow, serrate, or undulate crossbars on back; gular region barred in females; no series of light spots on back.

Description.[1]—Head scales smooth, rather strongly convex; interparietal pentagonal, about twice the size of either parietal; parietals single on each side; frontoparietals square, separated from each other by contact of frontal and interparietal; frontal transversely divided, the posterior section about three-fifths the size of the anterior section; prefrontals in contact medially; three frontonasals, the median scale about the size of a prefrontal, slightly larger than either lateral frontonasal; latter scales in contact on each side with both canthals; median frontonasal preceded by two small, broad scales, these preceded in turn by a pair of internasals separated from the nasal on each side by one scale and from the rostral by two small scales; one small and three large supraoculars on each side, all except the fourth separated from median head scales; scales in the row between supraoculars and median head scales decreasing in size posteriorly; two small scales inserted between parietal and last supraocular, leaving only about one-fourth of the medial edge of the latter scale in contact with the frontoparietal; a single row of small scales between supraoculars and superciliaries; six superciliaries on each side, the last somewhat enlarged and protrudent; two canthals, normal; nasal single, nostril pierced nearer posterior edge than anterior; three small scales behind nasal; a small scale between anterior canthal and broad scales in front of median frontonasal; subnasal long, narrow; loreal single; preocular divided on one side, entire on other; subocular moderate in size, followed posteriorly by two keeled postoculars; two rows of lorilabials, not reduced to one row below subocular; one row of lorilabials, beginning below subnasal, continuous around snout; lorilabials on sides of head keeled; four supralabials and five infralabials to a point below middle of eye; labials not keeled, not imbricating.

[1] Based on EHT 8560, male.

Rostral low, its upper edge slightly V-shaped; mental pentagonal, its labial border slightly more than half that of rostral; scales of outer row of lorilabials imbricating posteriorly, the anterior scale separated from mental by partial contact of first infralabial and first postmental; inner row of labiomentals terminating anteriorly about even with suture between second and third infralabials; three pairs of well-differentiated postmentals, the scales of the anterior pair in contact medially; gular scales smooth, approximately equal in size (except small scales between postmentals), the anterior scales slightly smaller than the others; all of gular scales except the anterior ones with one or two apical notches; some of scales immediately below ear keeled and mucronate; scales in gular fold region with no more than two terminal mucrones.

Three or four well-differentiated, smooth, rounded or pointed auricular lobules, the largest subequal in size to or slightly smaller than preceding scales; temporal scales keeled, mucronate, five between postoculars and auricular lobules (minimum); scales between ear and lateral nuchal fold somewhat larger than temporal scales, keeled, strongly mucronate, denticulate.

Dorsal scales keeled, strongly mucronate, denticulate, not reduced in size between hind legs; lateral scales somewhat smaller than dorsals, slightly more strongly keeled, mucronate and denticulate; scales in axilla very small (almost granular), but imbricating; scales in groin smooth, mucronate and notched, about one-third or one-fourth size of median lateral scales; ventral scales on chest and abdomen with one or two notches; scales on chest between axillae somewhat smaller than scales on anterior part of chest; abdominal scales becoming larger posteriorly and toward sides of abdomen; largest preanal scales slightly smaller than gular scales, a little more than one-half the size of scales on ventral surface between hind legs; some of preanal scales pore-like.

Dorsal scales of foreleg keeled, mucronate, denticulate, those on upper foreleg about two-thirds size of dorsal scales on body, about one-third larger than scales on lower foreleg; scales on elbow reduced in size; ventral scales of foreleg smooth except toward hand, mucronate and notched, those on lower foreleg subequal in size to dorsal scales of same member, three or four times as large as ventral scales of upper foreleg; lamellar formula for fingers 7–12–17–17–10 (7–12–16–17–11).

Dorsal scales of hind leg keeled, mucronate, not or weakly denticulate, those on thigh slightly less than two-thirds size of largest

dorsal scales on body, equal to or slightly smaller than dorsal scales on shank; ventral scales on shank smooth, rounded or notched, subequal in size to dorsal scales of same member; scales on anterior surface of thigh equal in size to dorsal scales of same member, decreasing slightly in size on the ventral surface toward series of femoral pores, and becoming smooth, notched; scales in front of femoral pore series subequal in size to preanal scales; scales on posterior surface of thigh considerably smaller than preanals; scales at posterior margin of insertion of hind leg very small; no postfemoral dermal pocket; lamellar formula for toes 9–12–16–20–13 (8–11–16–19–13).

Dorsal caudal scales strongly keeled, strongly mucronate, not denticulate, the largest no larger than dorsal scales on body; subcaudals mucronate, notched toward base of tail, keeled except on the proximal fifth of the tail; enlarged postanals present, separated from each other by two small scales.

Color.—Adult males brownish-olive above; a dorsolateral light line on each side, originating on each side of neck and terminating on base of tail; inner (median) border of this light line very indistinct, fading into the general color of a broad area on middle of back; lateral border of dorsolateral light stripe usually distinct, with a dark band below it, extending from posterior corner of eye to shoulder (this part very narrow), thence to base of tail, this dark band occasionally indistinct or broken; sides of body with narrow transverse black bars; labia barred; limbs indistinctly banded; a dark longitudinal line on outer surface of shank; posterior surface of thigh with two longitudinal dark lines, the lower shorter, separated from each other by a white line; dark markings on back absent or very indistinct; a large black spot on shoulder, usually enclosing from one to three irregular small blue spots.

Middle of gular region dark to pale blue, the color sometimes extending onto labia; labia usually somewhat tinged with orange, with a number of dark blue bars converging toward middle of throat, where they become more distinct; sides of belly cyanine blue, sometimes darker medially, but usually not distinctly dark-bordered; the dark bars on sides of body frequently passing through belly patches; ventral surfaces of limbs, tail, chest, and a band down middle of abdomen cream or flesh color; no dark markings in these latter areas.

Females similar to males, with the following exceptions: general ground color olive-gray; lateral dark band indistinct or broken;

undulate or serrate narrow dark bands across back; throat with blue-gray bars, not fusing medially; abdomen otherwise immaculate.

Young much as in females, the dorsal transverse bars more distinct, eight or nine in number, sometimes with light spots scattered across their posterior borders; throat barred as in adults.

In life the females are red-headed, and can easily be distinguished from males at a distance.

Variation.—The following data on variation in the scutellation of the head have been taken from 68 specimens. Parietals and frontoparietals single on each side in all; frontoparietals in contact medially in one, separated by an azygous scale in three; frontal in contact with interparietal in 64; frontal entire in one; supraoculars three to five (136 counts: 3, two; 4, one hundred and thirty-one; 5, three); fifth supraocular in partial contact with median head scales in all but three (data recorded in 160), and on one side in one of these; prefrontals in contact medially in 26, separated by an azygous scale in 24; median frontonasal in contact with frontal in 35; first canthal touching lorilabials in four (fused abnormally with loreal in one of these); second canthal in contact with subnasal on both sides in one specimen, on one side in four; preocular divided on both sides in 15, on one side in 11 (85 specimens examined); lorilabials in two complete rows below subocular in all but one; outer row of labiomentals in contact with mental on both sides in two specimens, on one side in one.

Dorsal scales 28 to 34, average 30.5 (37 counts: 28, two; 29, five; 30, fourteen; 31, nine; 32, five; 33, one; 34, one); ventral scales 33 to 44, average 39.5 (37 counts: 33, two; 34, one; 35, three; 36, four; 37, four; 38, four; 39, six; 40, two; 41, six; 42, two; 44, three); scales around body 30 to 37, average 33.1 (37 counts: 30, one; 31, five; 32, eleven; 33, eight; 34, three; 35, four; 36, three; 37, two). Femoral pores two to six (2, three; 3, eighty-three; 4, one hundred and sixty; 5, sixty-four; 6, ten). Ninety-two other specimens from Chilpancingo were counted; one had the count of two–three; the remainder had counts from three to five (numbers not recorded). In total number of pores per specimen, the counts are as follows (150 counts: 4, one; 5, one; 6, twenty-seven; 7, seventeen; 8, fifty-nine; 9, nineteen; 10, nineteen; 11, four; 12, three).

Remarks and relationships.—I conclude that *horridus* and *spinosus* do not intergrade. The closest approach of their ranges is in Oaxaca (unless the locality records from the city of Puebla are correct, in which case it is certain that *spinosus* and *horridus* over-

lap), into which state *horridus* follows the Rio Balsas basin. Specimens of *spinosus spinosus* from localities in Oaxaca north of the Rio Balsas average the same as specimens well within the range of the subspecies; specimens from localities in Oaxaca south of the river have a much higher number of femoral pores than *spinosus spinosus*. No population of *spinosus spinosus* has been observed with a tendency stronger than average of the supraocular scales to parallel the condition in *horridus*. A single specimen having the characters of *horridus horridus* is stated to have been collected in the Valley of Mexico (MCZ 339911, collected by W. W. Brown). I believe the locality to be incorrect; specimens of other species collected by Brown also appear to bear erroneous locality data. Much collecting in the Valley of Mexico has not revealed other specimens of *horridus*.

The distinctness of *horridus horridus* and *h. oligoporus* is less obvious. The greatest difference lies in the number of femoral pores. I have counted the pores on all specimens examined of both subspecies (although the data were recorded on less than half), and separation of the two on this character seems not a matter of prejudice. There is admittedly a considerable overlapping (on the count of three), but a series of three or four from one locality is sufficient for correct allocation, although identification of a single specimen at hand may sometimes be difficult. Only two specimens of *horridus horridus* examined have two femoral pores on one side (three on the other), and one with two on both sides. The former two were collected near Chilpancingo, Guerrero, the latter specimen near Puente de Ixtla, Morelos. A sufficient number of specimens is available from both localities to demonstrate that these counts are aberrant.

Four specimens from Xaltianguis, Guerrero (near the coast), have only the count of two; one specimen from Zihuatenejo, Guerrero, has the count of two–two; and three specimens from Balsas (city), Guerrero, have the count of two–two; these specimens have been placed with *h. oligoporus*. The present collections do not demonstrate how far southeast near the Pacific coast *h. oligoporus* extends; probably, it extends no farther along the Balsas River than Balsas; specimens taken near Mexcala, about 30 km. up the river, show an average femoral pore count between that of typical *horridus horridus* and *h. oligoporus;* the counts are three–three (seven) and four–four (three). This is considered an intergrading population.

In the following summary of femoral pore counts the two counts for each specimens are totaled:

Range	*h. horridus* 4–12 (150) Per cent	*h. oligoporus* 4–7 (114) Per cent
Average	8.0	4.7
5 or less	1.3	75.4
6 or less	19.3	97.4
7 or less	30.7	100.0

Arbitrarily assuming the line of division between the two forms to be between six and seven, those falling below being *h. oligoporus*, and those above, *h. horridus*, 19.3 per cent of *h. horridus* would be incorrectly identified, and 2.6 per cent of *h. oligoporus*. Using the number of femoral pores as the key character, only 12.1 per cent of the total number of specimens of both subspecies would be incorrectly allocated.

Two other characters very nearly approach the femoral pore count in value for diagnosis of the two subspecies:

	h. horridus Per cent	*h. oligoporus* Per cent
Prefrontals in contact	30.6	73.0
Preocular entire on one or both sides	82.4	12.2
Preocular divided on one or both sides	30.6	92.1

Habits and habitat.—This subspecies is found on *Opuntias* and rock walls in relative abundance. Individuals observed seemed not extremely wary.

Locality records.—GUERRERO: 11–12 mi. S of Puente de Ixtla (EHT 8555, 8587–91, 8627–8, 8636, 8647–8); Taxco (EHT 8592–5); El Naranjo (EHT 8596–7); 16 km. N of Mexcala (EHT 8598); Mexcala (EHT 8559–60, 8599–8600, 8637–8, 8655–7, 8659); Chilpancingo (EHT 8601–3, 8602A; UMMZ 72413[10]; MCZ 33851–78, 33880–33900 [+45]; USNM 47198, 47733; WM 2; SDSNH 16304–5); 16 km. S of Chilpancingo (EHT 8586A); 12–14 mi. S of Chilpancingo (EHT 8604–9, 8609A, 8612, 8618–9, 8639–41, 8658); Tierra Colorada (EHT 8610–1, 8624, 8642; WM 4); between Cajones and Acahuizotla (EHT 8625); Palo Blanco (EHT 8643); 3 mi. N of Taxco (EHT 8660); Lake Tuxpan, near Iguala (EHT 8622–3); Acuitlapan (EHT 8654); Cañada de Ixtapa (Sumichrast, 1882); Ayutla (Gadow, 1905); Chilapa (Ahl, 1934). MORELOS: 2 mi. N of Cuernavaca (EHT 8567–71, 8569A); Cuernavaca (EHT 8572–81; MCZ 33912; USNM 20177–8, 20173–6; LSJU 3785–92, 3798, 3803–8); 9 mi. S of Cuernavaca (EHT 8582–6); Puente de Ixtla (EHT 8613; FMNH 1012[4]; USNM 47928–30); Cuautla (EHT 8614; FMNH 1281[7]); 4 mi. S of Cuernavaca (EHT 6556–8, 8615–7, 8629–35, 8649–53); 5 mi. S of Puente de Ixtla (EHT 8644–5); Jojutla (FMNH 1290 [5]); Yautepec (FMNH 1352); Amitcingo (EHT 8626); Xochicalco (MCZ 9542). OAXACA: Chazumba (EHT 8620); Cuicatlán (EHT

8561–6; USNM 47195, 47613, 46838, 47458–9, 47367); Huajuapam (USNM 47193). PUEBLA: Zapotitlán (EHT 8646); (?)Puebla (USNM 47699; AMNH 17990, 18795).

Sceloporus horridus oligoporus Cope.

Sceloporus oligoporus Cope, Proc. Acad. Nat. Sci. Phila., **1864**, pp. 177–178, 1864; Sumichrast, Bibl. Univ. Rev. Suisse, **46**, p. 243, 1873; Van Denburgh, Proc. Acad. Nat. Sci. Phila., **1897**, p. 463, 1898; Stejneger, N. Amer. Fauna, **14**, p. 67, 1899.

Tropidolepis horridus Dugès, Naturaleza, **1**, p. 143, 1870.

Sceloporus horridus Bocourt, Miss. Sci. Mex., Zool., **3**, sec. 1, pp. 178–179, pl. 18, figs. 8, 8*a*, 8*b*, 1874 (fig. of *h. oligoporus*) (part); Garman, Bull. Essex Inst., **16**, p. 17, 1884 (part); Cope, Proc. Amer. Phil. Soc., **22**, p. 396, 1885 (part); idem, Bull. U. S. Nat. Mus., **32**, p. 35, 1887 (part); idem, Ann. Rept. U. S. Nat. Mus., **1898**, pp. 353–354, 1900 (part).

Sceloporus spinosus horridus Boulenger, Cat. Liz. Brit. Mus., **2**, p. 227, 1885 (part); idem, Proc. Zool. Soc. Lond., **1897**, pp. 491, 493–495, 1897 (part).

Sceloporus spinosus Günther, Biol. Cent.-Amer., Rept. Batr., pp. 63–64, 1890 (part); Gadow, Jorullo, pp. 55, 57, 1930 (part).

Sceloporus boulengeri(?) Van Denburgh, Proc. Calif. Acad. Sci., (2), **6**, p. 341, 1896; (?) idem, Proc. Acad. Nat. Sci. Phila., **1897**, p. 463, 1898.

Sceloporus clarkii boulengeri Burt, Trans. Amer. Micr. Soc., **54**, pp. 171–172, 1935 (part).

Sceloporus horridus oligoporus Taylor, Univ. Kans. Sci. Bull., **24**, p. 520, 1938.

Type locality.—Colima, Colima, Mexico. Cotypes USNM 31386–93, collected by John Xantus.

Distribution.—Western Guerrero, southern and central Michoacán, Colima, and central Jalisco (fig. 11).

Diagnosis.—Most characters as in *horridus horridus*. Frontonasal rarely contacting frontal; prefrontals usually in contact; preocular usually divided; femoral pores two or three, rarely four, rarely totaling more than six on both sides. Color pattern essentially as in *horridus horridus;* lateral light lines more distinct; transverse bars on back indistinct, frequently replaced by more or less rounded light spots (especially in males), which form two series on each side of the mid-dorsal line; females without any markings whatsoever on ventral surfaces; males usually with fairly distinct convergent blue bars on throat; sides of belly in males with markings similar to those in *horridus horridus*, somewhat lighter.

Variation.—The following data on variation in head scutellation have been taken on 89 specimens. Frontoparietals in contact medially in nine, separated by an azygous scale in eight; frontal in contact with interparietal in 72; prefrontals in contact medially in 65, separated by an azygous scale in 17; median frontonasal in con-

tact with frontal in seven (abnormal fusion in one case); five supraoculars on one side in three specimens, four in all others; first canthal in contact with lorilabials on one side in one, on both sides in one; second canthal in contact with subnasal on one side in one, on both sides in one; preocular divided on both sides in 90 specimens, on one side in three (101 examined); lorilabials reduced to one row by contact of a single scale with both suboculars and supralabials on one side in one, on both sides in four; outer row of labiolabials in contact with mental on one side in four, on both sides in four. Other scale characters vary as in *horridus horridus*.

Dorsal scales 27 to 33, average 30.8 (37 counts: 27, two; 28, one; 29, five; 30, eight; 31, seven; 32, seven; 33, seven); ventral scales 35 to 43, average 37.4 (36 counts: 35, five; 36, nine; 37, six; 38, four; 39, five; 40, three; 41, two; 42, one; 43, one); scales around body 29 to 36, average 32.8 (37 counts: 29, two; 30, one; 31, three; 32, eight; 33, twelve; 34, four; 35, six; 36, one). Femoral pores two to four, average 2.3 (230 counts: 2, one hundred and fifty-eight; 3, sixty-nine; 4, three); total number of femoral pores for each specimen four to seven, average 4.7 (114 specimens: 4, seventy; 5, sixteen; 6, twenty-five; 7, three).

Habits and habitat.—The subspecies seems to be fond of rock fences, where many were collected in Colima and Michoacán. At Uruapan, the few specimens encountered were on the ground, scurrying about in the oak leaves and pine needles. They usually took refuge under rocks; one sought a small tree, from which it was shot.

Locality records.—DURANGO: Ventanas (Boulenger, 1885). ZACATECAS: San Juan Capistrano (USNM 46932–3); Valparaiso (USNM 47815). JALISCO: (USNM 46935); Hda. de Santa Maria, near Magdalena (AMNH 18455–6); Jamay to Hda. de Capulines (AMNH 18430); Guadalajara (AMNH 17978; USNM 24924); W of Hostotipaquillo (AMNH 15516); Itzatlan (USNM 47886); Huejuquilla (USNM 46928); Atemajac (USNM 47892–3); Bolaños (USNM 46929); Chapala (USNM 18977; EHT 8488, 8526–8, 8510); Magdalena (EHT 8521–5, 8468–74; AMNH 18465); La Quemada (EHT 8520); Ixtlán (Boulenger, 1897); Puentillo de Acatan (Boulenger, 1897); N of Rio Santiago (Günther, 1890). MICHOACÁN: Uruapan (EHT 8493–4, 8550); Hda. El Sabino (EHT 8495–8509, 8529–49); Jorullo (Gadow, 1930). COLIMA: (FMNH 1656); La Quinta (AMNH 15510); Colima (AMNH 15635–45, 15654, 15751–2, 12743, 12751, 12754, 12767–9, 15515, 12744; USNM 31386–93, 31497–501, 31466–77, 63854); 4 mi. NE of Colima (AMNH 12739); 4 mi. SE of Colima

(AMNH 12740); 5 mi. SW of Colima (AMNH 12766); Villa Alvarez (UMMZ 80060[6], 80073, 80074[3], 80075, 80079[2]; AMNH 15511); San Cayetano (AMNH 15513); Estancia (AMNH 15514); Manzanillo (EHT 8484–7); Hda. La Queseria (EHT 8475–83; UMMZ 80072[2]); Hda. Paso del Rio (UMMZ 80078[4], 80077[3]; EHT 8489–92); Salvador (UMMZ 80076[3]). Guerrero: Balsas (FMNH 1010 [2], 1726); Zihuatenejo (LMK 7335); Xaltianguis (EHT 8551–4).

Sceloporus horridus albiventris subsp. nov.

Type from Tepic, Nayarit, No. 8519 Taylor Collection. Male. Collected in 1934 by Edward H. Taylor. Paratypes (six topotypes), E. H. Taylor Coll. 8511B, 8511–2, 8514, 8517, 8519A.

Distribution.—Northern Jalisco to southern Sinaloa, in the coastal region (fig. 11).

Diagnosis.—A *Sceloporus* of moderately large size, maximum snout-vent measurement about 102 mm.; scutellation similar to that of *horridus oligoporus;* dorsal scales 29 to 33; supraoculars usually four, the fourth usually in partial contact with median head scales; frontal usually in contact with interparietal; preocular usually divided; femoral pores on each side two or three, rarely four, rarely totaling, on both sides, more than six. Dorsal color pattern similar to that in *horridus oligoporus;* a dorsolateral light line present; a row of small dark spots and a row of similar light spots (each about the size of a scale) on each side of mid-dorsal line; ventral surfaces in both sexes immaculate or, in males, with very slight tinges of blue on sides of abdomen, and very faint evidence of gular bars.

Description of type.—Head scales smooth, pitted; interparietal moderate in size, pentagonal; one parietal on each side, slightly more than half the size of interparietal; frontoparietals rectangular, narrowly separated medially by contact of frontal and interparietal; posterior section of frontal quite small, a little less than half the size of anterior section; two prefrontals, in contact medially; three frontonasals, the median the largest, the lateral scales separated from first superciliary; internasals irregular; nasal separated from rostral; four–four supraoculars, the anterior the smallest, the posterior the largest; first supraocular in contact with first and second superciliaries; a row of scales, beginning anteriorly at the first superciliary, intercalated between the first three supraoculars and the median head scales, terminating very slightly posterior to the suture between the third and fourth supraoculars; another row of small

scales intercalated between parietal and fourth supraocular, leaving the frontoparietal almost completely in contact with the fourth supraocular; five superciliaries visible from above on each side; a single row of small scales intercalated between the supraoculars and superciliaries, terminating anteriorly at the first supraocular; two canthals on each side, the second somewhat larger than the first and entering into the superciliary series; subnasal present, moderately large; three loreals on one side, two (the lower very small) on the other; preocular transversely divided on both sides, the lower part split into two scales on one side; subocular rather short, followed posteriorly by two small, keeled postoculars, two rows of lorilabials, not reduced to one row at any point below subocular; lorilabial scales weakly keeled on sides of head; approximately four supralabials and five and one-half infralabials to a point below middle of eye; posterior labials weakly keeled.

Mental pentagonal, its labial border slightly more than one-third that of rostral; two pairs of fairly well-developed postmentals, the scales of the anterior pair in contact medially, the scales of the posterior pair separated by several small scales; gular scales smooth, with one or two apical notches; median gular scales somewhat larger than lateral gular scales; scales immediately below ear weakly keeled.

Temporal scales weakly keeled, weakly mucronate, somewhat larger than largest scales between ear and lateral nuchal fold; auricular lobules small, acuminate, smooth; scales posterior to ear quite small, becoming larger, more strongly keeled and strongly mucronate toward lateral nuchal fold; dorsal scales keeled, strongly mucronate, weakly denticulate (more strongly on neck), and reduced in size posterior to occiput; median lateral abdominal scales somewhat smaller than median dorsals, more strongly denticulate; ventral scales on body from chest to interfemoral region approximately equal in size, about two-thirds size of median dorsal scales, smooth, with one or two (usually two) apical notches; scales in interfemoral and preanal regions somewhat reduced in size; some of preanal scales pore-like; gular scales somewhat smaller than scales on belly.

Dorsal scales of foreleg keeled, mucronate, those on upper foreleg about one-half size of largest dorsal scales on body, somewhat larger than dorsal scales on lower foreleg; ventral scales of lower foreleg smooth anteriorly, keeled posteriorly and toward hand, considerably larger than ventral scales of upper foreleg; latter scales very weakly keeled; lamellar formula for fingers 8–13–16–17–11 (8–12–17–16–11).

Dorsal scales of thigh and shank mucronate, denticulate, strongly keeled, subequal in size, somewhat larger than dorsal scales of upper foreleg; ventral scales of shank smooth, rounded or acuminate; scales on anterior surface of thigh somewhat smaller than dorsal scales of same member, the scales becoming smaller, smooth and acuminate ventrally toward femoral pore series; largest scales on posterior surface of thigh somewhat smaller than preanal scales, keeled, mucronate, denticulate; scales on posterior surface of thigh largest medially, becoming smaller distally and proximally; no postfemoral dermal pocket; postanal scales enlarged, separated from each other medially by two small scales; lamellar formula for toes 8–13–17–22–13 (8–12–16–19–13).

Scales on rump very slightly reduced in size; dorsal caudal scales not larger than dorsals on body, keeled, strongly mucronate, not denticulate; subcaudals smooth proximally, acuminate.

Color.—Much as in *horridus oligoporus*, except belly immaculate in both sexes or, in males, a slight suffusion of pale blue on sides of abdomen, and faint indications (in some) of gular bars.

Remarks.—I have been unable to discern any consistent differences in scutellation between *horridus oligoporus* and *horridus albiventris*. The essential difference lies in the ventral coloration of the males. In *horridus oligoporus*, the adult males have distinct bars on the gular region, and the lateral belly marks are quite distinct; the ventral maculation is not so brilliant as in *horridus horridus*, however. In *horridus albiventris* there is no evidence whatsoever, in adult males, of the typical ventral maculation, except a very slight bluish tinge on the sides of the abdomen and (in some) faint gular bars.

Locality records.—SINALOA: Rosario (USNM 47677–8, 47681). NAYARIT: Mt. San Juan, near Tepic (EHT 8511A, 8519A); Tepic (USNM 58812–3, 64669); Telatan (AMNH 15518); between Barranca Blanca and Trepichillo (AMNH 15520). JALISCO: San Sebastian (USNM 64656).

Sceloporus olivaceus Smith.

Sceloporus spinosus Hallowell, in Sitgreaves, Rept. Exped. Zuni Colorado R., p. 144, 1854; Baird, in Emory, U. S.-Mex. Bound. Surv., **2**, pt. 2, No. [3], p. 5, 1859 (part=figs. of *magister magister*); idem, U. S. Pacif. R. R. Explor. Surv., **10**, Lieut. Whipple's Rept., p. 37, 1859; Cope, Bull. U. S. Nat. Mus., **1**, p. 49, 1875; idem, **17**, pp. 17, 44, 46, 1880; Hurter, Cat. Rept. Batr., Missouri, 1883; Yarrow, Bull. U. S. Nat. Mus., **24**, p. 63, 1883 (part); idem, Smithson. Misc. Collec., **517**, p. 10, 1883 (part); Cragin, Bull. Washburn Lab. Nat. Hist., **1**, p. 7, 1884; Garman, Bull. Essex Inst., **19**, p. 132, 1887 (part?); Cope, Proc. U. S. Nat. Mus., **11**, p. 397, 1888;

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Type locality.—Arroyo los Olmos, three miles southeast of Rio Grande City, Starr County, Texas. Type EHT 2508, collected by E. H. Taylor and John S. Wright.

Distribution.—Extreme south-central Oklahoma, southward through central Texas to southern Tamaulipas, central Nuevo León, and southeastern Coahuila (fig. 11).

Diagnosis.—A large species of *Sceloporus* of the *spinosus* group, maximum snout-vent measurement 121 mm.; cephalic scales smooth; dorsal scales 28 to 33 from occiput to base of tail, not strongly mucronate, keeled, weakly denticulate, in parallel rows, not strongly differentiated from lateral scales; latter two-thirds or three-fourths size of dorsals, their keels, mucrones and denticulations more prominent; ventral scales somewhat smaller than laterals, strongly notched, largest on breast; preanal scales as large as median ventral abdominals, largest between series of femoral pores, much larger than scales on posterior surface of thigh; dorsal limb scales no smaller than ventral abdominals, those on hind limb larger; supraoculars five to seven, usually five, separated from median scales by a row of small scales (narrowly in contact in one specimen in 99); supraoculars separated from superciliaries by one complete and usually another incomplete series of scales; frontal usually contacting interparietal; prefrontals usually contacting medially; frontonasal rarely contacting frontal; lorilabials usually reduced to one row at some point below subocular; preocular rarely divided; outer row of labiomental scales rarely in contact with mental; first canthal very rarely in contact with lorilabials; second canthal rarely contacting subnasal. Auricular lobules elongate, four or five, the median lobules larger than upper or lower lobules; femoral pores 11 to 16. Tibia longer than head from snout to occiput; fourth toe longer than head from snout to posterior border of ear. Two broad dorsolateral light lines in males, indistinct in females, passing from parietal region to base of tail; a broad darker area between these lines, with irregular, dark, narrow crossbars, some passing through the dorsolateral light lines, more distinct in females; no dark bars on throat; a narrow blue area on each side of abdomen in males, not dark-bordered medially;

usually some narrow, black lines on ventral surface of thigh, and invariably a narrow black line from gular region down middle of abdomen onto tail.

Color.—General dorsal ground color (in males) army brown to sorghum brown; a light, sometimes somewhat indefinite, dorsolateral stripe about two half or one and one-half scale rows wide, passing from neck onto base of tail; between these a broad brownish band, sometimes with indefinite lighter spots scattered over it, occasionally with very indistinct darker brown bands; dorsolateral light stripes broken by narrow crescent-shaped dark bars, which disappear on sides of body and occasionally are visible on median brown band; an irregular dark brown band below dorsolateral light line, originating at posterior corner of eye, where it is very narrow, and continuing above arm, where it becomes broader and more irregular in width, terminating on sides of tail; an indefinite lighter band below this, passing from axilla to groin, interspersed with darker spots; lighter scales in this band frequently with a bluish tinge; below lateral light band, another indefinite narrow dark brown line; a black spot on shoulder, pierced by a light band which originates in upper labial region, passes through ear, then curves downward, passes through black shoulder area, and terminates above arm; limbs with narrow dark bands, the distal edge of each distinct, the proximal edge indefinite; digits also banded; tail with indistinct darker bands.

Ventral surfaces dusky; throat suffused with lavender, the posterior central area tinged with pale blue; sides of belly lavender, with numerous scattered spots of pale blue; lateral belly patches not dark-bordered, separated from each other by a broad light band about six scale rows wide medially, wider anteriorly and posteriorly; irregular narrow streaks of dark gray on chest and middle of abdomen; a similar streak in the midventral line in interfemoral region; ventral surface of thigh with a narrow longitudinal dark streak near insertion, disappearing distally.

Dorsal ground color in females light gray or yellow-gray; dorsolateral light lines indistinct; a series of about eight irregular broad black or dark brown crossbars on back, continuing onto tail, which is distinctly barred; dorsolateral light lines sometimes bordered below by a dark line similar to that in males, except that it is narrow for its entire length; no markings on sides of abdomen; black shoulder spot absent or indistinct; limbs barred as in males, but more distinctly; ventral surfaces immaculate save for narrow dark streaks of

gray; a median interfemoral dark streak, as in males, and usually one in middle of chest (large females entirely immaculate below).

Newman and Patterson (1909) state that in life there are paired spots of blue under the chin in males, and that "faint suggestions of blue are found on the females, but are not noticeable unless careful examination is made."

Variation.—The following account of variation in cephalic scutellation is based on examination of 100 specimens, unless otherwise stated: parietal single in all; frontoparietal single on each side except in two specimens, in which there are two on one side; frontoparietals in contact medially in 23, separated by an azygous scale in nine; frontal in contact with interparietal in 68; frontal entire in one, the anterior section longitudinally divided in four, the posterior section transversely divided in two; superciliaries six or seven (84 counts: 6, eighty-one; 7, three); supraoculars four to seven (194 counts: 4, two; 5, one hundred and twenty-nine; 6, fifty-three; 7, ten) (the specimen with four has the first supraocular split into several small scales; four enlarged scales follow this); one of the supraoculars narrowly in contact with median head scales on one side in three specimens (141 examined); prefrontals in contact medially in 68, separated by an azygous scale in 29; median frontonasal in contact with frontal in two (prefrontals irregular in one); median frontonasal separated from lateral frontonasals on both sides in six, on one side in one; internasals irregular in four, one pair in two, two pairs in 27, one pair with three scales following in nine (42 specimens counted); subnasal present in all; first canthal in contact with lorilabials on both sides in two specimens; first canthal forced above canthal ridge by contact of second canthal and subnasal on both sides in two, on one side in two; two complete rows of lorilabials below subocular on both sides in 14, on one side in 13, reduced to one row by a scale in contact with both subocular and supralabials on one side in 13, on both sides in 73; two loreals on both sides in two, on one side in one (42 counted); two to four postrostrals (43 counts: 2, three; 3, two; 4, thirty-eight); preocular divided on both sides in 12, on one side in nine; outer row of labiomentals in contact with mental on both sides in nine, on one side in six.

Dorsal scales 28 to 33, average 29.8 (60 counts: 28, one; 29, twenty-four; 30, nineteen; 31, fifteen; 33, one); ventral scales 40 to 52, average 45.1 (54 counts: 40, one; 41, four; 42, five; 43, nine; 44, seven; 45, five; 46, seven; 47, seven; 48, one; 49, one; 50, five; 52, two); scales around body 30 to 39, average 35.4 (61 counts:

30, one; 31, one; 32, two; 33, three; 34, eight; 35, seventeen; 36, sixteen; 37, six; 38, four; 39, three). Femoral pores 11 to 16, average 13.3 (197 counts: 11, eight; 12, forty-seven; 13, sixty-four; 14, forty-five; 15, thirty; 16, three).

Females attain a greater size than males. The largest male examined measures 97.5 mm. from snout to vent, while the largest female measures 121 mm.

There is no definite geographical trend in the above variation. Femoral pore counts of specimens from Tamaulipeca, Tamaulipas, and other localities in Mexico show no trend toward the average in *s. spinosus*. All specimens have five or more supraoculars and the dorsal scales are not strongly mucronate. None show a tendency toward *s. spinosus* in coloration.

Comparisons.—S. olivaceus differs from *s. spinosus*, of which it usually has been considered a subspecies, in a number of characters which seem to show no tendency toward intergradation. These may be cited as follows: supraoculars five or more (usually four in *s. spinosus*); femoral pores more than ten (usually ten or less in *s. spinosus*); gular region never barred (barred in both sexes of *s. spinosus*); dorsal scales not strongly mucronate (strongly mucronate in *s. spinosus*); lorilabials usually reduced to one row below subocular in *olivaceus* (two complete rows in *s. spinosus*); median auricular lobules largest (upper lobule or lobules largest in *s. spinosus*); prefrontals usually in contact medially (usually separated in *s. spinosus*); females much larger than males (males larger than females in *s. spinosus;* 110 mm. is the greatest snout-vent measurement in females, 118 mm. in males).

The differences between *olivaceus* and *undulatus floridanus* are difficult to point out. There are no constant differences in scutellation. There is very appreciable difference in size, *u. floridanus* reaching a maximum at about 75 or 80 mm. snout to vent (about 121 mm. in *olivaceus*). There are a number of differences in coloration, the most useful of which is the color of the posterior surface of the thigh. In *u. floridanus* a broad, dark line is present on the posterior surface of the thigh, and the area above it is frequently mottled. In *olivaceus* the posterior surface of the thigh is nearly immaculate; a short, narrow dark line is frequently present near the margin of the insertion of hind leg. Adult males are easily distinguished on the basis of ventral and dorsal coloration; in *u. floridanus* there are no dorsolateral light lines, and bars are visible on the back. In adult males of *olivaceus*, the dorsolateral light lines are distinct, and the dorsal

bars are nearly or quite absent. In males of *u. floridanus*, the sides of the belly are dark blue, and the patches are closely approximated medially, or confluent; the posterior part of the gular region is black, with small blue patches near the angles of the jaws.

S. olivaceus was described under the impression that it represented a species different from the Texas species known at that time as *spinosus floridanus*. I am at present inclined to agree with Burt (1936), who believes *olivaceus* to be identical with the Texan "*spinosus floridanus*."

Habits and habitat.—In Texas, specimens are almost always found in trees or bushes. Their color blends well with that of the bark of trees and they are undoubtedly frequently overlooked because of this protective coloration. One's attention is frequently attracted to them only by their noisy movements. They are as a rule rather wary, and climb high in the trees to escape danger. If closely pressed they frequently descend into holes in trees.

Pritchett (1903) gives an extensive account of laboratory experiments in feeding this lizard with a great variety of insects. Vertebrate food (small lizards) is occasionally taken. Specimens were observed drinking by sucking water into the mouth; Newman and Patterson (1909) confirm this observation.

Newman and Patterson (1909) give an extensive account of the life history of *olivaceus*, to which the reader is referred as perhaps the best such work on a lizard of this genus.

Specimens are frequently found infested with a red mite described as *Geckobiella texana* (Banks, Proc. Ent. Soc. Wash., 1904, **7**, p. 22).

Distribution.—Extreme south-central Oklahoma, southward through central Texas to southern Tamaulipas, central Nuevo León and southeastern Coahuila.

Locality records.—OKLAHOMA.—LOVE CO.: Near Marietta (KU 15024–6). NEW MEXICO.—LINCOLN CO.: Capitan Mts., 9,000 ft. (USNM 44905). TEXAS.—ATASCOSA CO.: Pleasanton (KU 15031); Somerset (KU 12470, 15032–4, 15054, 15316–21); Benton (CM 8468). BASTROP CO.: Bastrop (Cragin, 1884). BEXAR CO.: (ANSP 19700); Helotes (KU 15035–46, 15315; ANSP 12436–43); San Antonio (AMNH 44400; FMNH 3468; CAS 31025–8; AMNH 7616, 7633–4, 46048–71, 37364–85; MCZ 4574[2]); 6 mi. S of San Antonio (UMMZ 71008); Leon Springs (CAS 31154–79). BOSQUE CO.: Union Hill and Valley Mills (Strecker, 1928). BROWN CO.: 3 mi. W of Brownwood (Burt, 1937, p. 536). BURNET CO.: (CM 1016–7; MCZ 7884); Burnet (KU 12632–5; FMNH 1664, 1838; CAS 13106–9). CALHOUN

CO.: Indianola (Baird, 1859). CALLAHAN CO.: Putnam (Burt, 1937, p. 536). CAMERON CO.: Point Isabel (KU 12640); Brownsville (KU 12642–6; AMNH 22985–6; UMMZ 53984[2], 53985, 53982; FMNH 5494–5, 6835–7, 6871–2; CM 243; AMNH 9420); 4 mi. E of Rio Hondo (UMMZ 74747); Los Fresnos Resaca, Brownsville (FMNH 5486–7); Laguna del Muerto, Brownsville (FMNH 5488); Harlingen (Strecker, 1928); Padre Id. (AMNH 8159). COMAL CO.: 5 mi. NE of New Braunfels (UMMZ 71143). CONCHO CO.: 4 mi. SE of Eden (UMMZ 55310). COOK CO.: Gainesville (KU 12641). DALLAS CO.: 5 mi. SE of Dallas (KU 11394–5); Bachman's Lake, 4 mi. NW of Dallas (MVZ 12519); Dallas (ANSP 13237, 12448–9). DIMMIT CO.: Nueces River, near Carrizo Wells (KU 11708–12); Carrizo Springs (MCZ 8280). DUVAL CO.: San Diego (ANSP 12446). EASTLAND CO.: Cisco (KU 15047–52). ELLIS CO.: 8 mi. NE of Midlothian (Burt, 1937, p. 536). EL PASO CO.: El Paso (Burt, 1937, p. 536); Fort Bliss (Van Denburgh, 1924). ERATH CO.: 12 mi. NE of Stephensville (Burt, 1937, p. 536). FALLS CO.: Gurley (CAS 33074–5; 1 mi. W of Marlin (CAS 12693). FAYETTE CO.: Rutersville (Cope, 1900). FRIO CO.: near Pearsall (EHT 222–4). GOLIAD CO.: Charco (AMNH 46072–6). GRAYSON CO.: 1 mi. N of Howe (Burt, 1937, p. 536). GUADELUPE CO.: (UMMZ 66734); Seguin (Bailey, 1905). HAYS CO.: San Marcos (AMNH 36980, 32457–65). HIDALGO CO.: McAllen (Burt, 1937, p. 536); 8 mi. S of San Juan (UMMZ 74746, 74751[2]); San Juan (UMMZ 74749); Mercedes (CM 194–6); Lomita Ranch, 6 mi. N of Hidalgo (Bailey, 1905). HOOD CO.: 5 mi. S of Paluxy (Burt, 1937, p. 536). JACK CO.: Bryson (Burt, 1937, p. 536). JIM WELLS CO.: 6 mi. E of San Diego (EHT 5044–5); 8 mi. NE of Alice (Burt, 1937, p. 536). KARNES CO.: Runge (Burt, 1937, p. 536). KENDALL CO.: 3 mi. N of Waring (Burt, 1937, p. 536); Boerne (Strecker, 1926). KERR CO.: Ingram (Bailey, 1905); 3 mi. W of Comfort (Burt, 1937, p. 536). KINNEY CO.: Ft. Clark (Burt, 1937, p. 536). McLENNAN CO.: Waco (KU 8171–2, 12636–7, 12647–50; UMMZ 42325[2], 42328[3], 70467, 70501; FMNH 1840[8]; LSJU 2189–94; CAS 13098–105, 33078–83; CM 1015, 1008–13); Robinson (CAS 33084–6); Mart (Burt, 1937, p. 536). MATAGORDA CO.: Bay City (CM 189–190). MAVERICK CO.: Eagle Pass (KU 15313). MILAM CO.: (Strecker, 1930). NUECES CO.: Corpus Christi (AMNH 1364–5). PALO PINTO CO.: 3 mi. W of Millsap (MVZ 12694); 3 mi. E of Palo Pinto (Burt, 1937, p. 536). REAL CO.: West Frio Canyon (Strecker, 1935). REFUGIO CO.: (Strecker, 1908). SAN SABA CO.: Brady Creek, 40–50 mi. S of Brownwood (KU 17204–6). SCURRY

CO.: 21 mi. N of Snyder (UMMZ 70791). SMITH CO.: 5 mi. W of Arp (Burt, 1937, p. 536). SOMERVELL CO.: Glen Rose (CAS 33076–7). STARR CO.: (UMMZ 74750[2]); Arroyo Los Olmos, 3 mi. SE of Rio Grande City (KU 15029–30; EHT 2508, 4922–4); Arroyo El Salado, 13 mi. SE of Rio Grande City (KU 15027–8; EHT 4785). SUTTON CO.: 26 mi. SE of Sonora (Burt, 1937, p. 536). TARRANT CO.: 1 mi. S of Texas Christian University, near Fort Worth (MVZ 12695). TOM GREEN CO.: San Angelo (ANSP 12450–1). TRAVIS CO.: Austin (KU 15053; FMNH 23688; ANSP 12445). VALVERDE CO.: near mouth of Devil's River (KU 11722–4, 12638); Castle Canyon, 17 mi. SE of Comstock (Burt, 1937, p. 536); Langtry (Bailey, 1905). WEBB CO.: Laredo (KU 12639). VICTORIA CO.: (Strecker, 1908). WILLACY CO.: Raymondsville (UMMZ 54113). WILSON CO.: between Polly Ranch and Sutherland Springs (Strecker and Johnson, 1935). ZAPATA CO.: Zapata (EHT 4722–4).

NUEVO LEÓN: Huasteca Cañon, 11 mi. W of Monterrey (EHT 8409A, 8409–12); Sabinas Hidalgo (EHT 8388–9, 8401–5, 13085–6); near Ciénega de Flores, km. 1030–6 (EHT 8406–8); 31 mi. S of Sabinas Hidalgo (EHT 8453–4); San Diego (USNM 42094); Cadereyta (USNM 2902); Charco Escondido (USNM 2961[4]); Monterrey (USNM 46752); Linares (USNM 47610); China (Yarrow, 1883). TAMAULIPAS: 36 mi. N of Limón (EHT 8413); 5 mi. S of Laredo (EHT 8387); Hda. La Clementina, 4 mi. W of Forlón (EHT 8399–8400); Victoria (USNM 46780); Jaumave (USNM 46729, 46731–2); Matamoros (USNM 9397[6]; MCZ 5944–5; CM 8469); Rancho El Plato, 38 mi. SE of Remosa (USNM 95181); 15 leagues N of Guerrero (USNM 47709); Mier (USNM 47710); La Cruz (FMNH 1291); Tamaulipeca 69243–6[14]); San José (UMMZ 69247); Mulato (UMMZ 69248); Manuel (MCZ 17487–8, 17490); Chocoy (MCZ 17489); Tampico (Günther, 1890). COAHUILA: Saltillo (USNM 47480).[1]

Sceloporus clarkii clarkii Baird and Girard.

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[1] One specimen (USNM 2325) is said to come from Fort Smith, Arkansas, a record apparently incorrect.

idem, N. Amer. Fauna, **7**, pp. 178–181, pl. 1, figs. 1 *a–c*, 1893; Cope, Amer. Nat., **30**, p. 1014, 1896 (part); Van Denburgh, Proc. Calif. Acad. Sci., (2), **6**, pp. 340–341, 1896; Herrick, Bull. Sci. Lab. Denison Univ., **11**, p. 126, 1899; Stejneger, N. Amer. Fauna, **14**, p. 67, 1899; Cope, Ann. Rept. U. S. Nat. Mus., **1898**, pp. 358–363, 1900 (part); Stejneger, Proc. U. S. Nat. Mus., **25**, p. 150, 1902; Stone and Rehn, Proc. Acad. Nat. Sci. Phila., **55**, pp. 30, 31, 1903 (part); Meek, Field Mus. Nat. Hist., Zool. Ser., **7**, p. 11, 1905; Mearns, Bull. U. S. Nat. Mus., **56**, pt. 1, pp. 104, 107, 110, 123, 126, 132, 1907 (part); Ditmars, Rept. Book, pp. 128, 131–133, 1907 (part); Ruthven, Bull. Amer. Mus. Nat. Hist., **23**, pp. 533, 537–538, 1907; Ditmars, Rept. World, p. 147, 1910 (part); Stone, Proc. Acad. Nat. Sci. Phila., **63**, p. 227, 1911; Van Denburgh and Slevin, Proc. Calif. Acad. Sci., (4), **3**, pp. 392, 404, 1913; Rüthling, Lorquinia, **1**, pp. 14–15, 1916; Stejneger and Barbour, Check List N. Amer. Amph. Rept., p. 53, 1917; Ditmars, Rept. World, revised ed., p. 147, 1922 (part); Van Denburgh, Occ. Papers Calif. Acad. Sci., **10**, pp. 359–364, 1922; Stejneger and Barbour, Check List N. Amer. Amph. Rept., 2nd ed., p. 54, 1923; Van Denburgh, Proc. Calif. Acad. Sci., (4), **13**, pp. 191, 207, 1924; Ortenburger, Mem. Univ. Mich. Mus., **1**, p. 53, 1928; Slevin, Proc. Calif. Acad. Sci., (4), **15**, pl. 199, 1926; Burt and Burt, Jour. Wash. Acad. Sci., **19**, pp. 450–451, 1929; King, Copeia, **1932**, p. 176, 1933; MacCoy, Occ. Papers Bost. Soc. Nat. Hist., **8**, pp. 18–19, 1932; Dury, Proc. Junior Soc. Nat. Hist., Cincinnati, **3**, p. 28, 1932; Allen, Occ. Papers Mus. Zool. Univ. Mich., **259**, p. 8, 1933; Stejneger and Barbour, Check List N. Amer. Amph. Rept., 3rd ed., p. 60, 1933; Slevin, Handbook Rept. Amph. Pacif. States, pp. 43, 58, 1934; Quaintance, Copeia, **1935**, p. 184, 1936; Ditmars, Rept. N. Amer., pp. 47, 50–51, 1936; Gloyd, Program Activ. Chicago Acad. Sci., **8**, p. 23, 1937.

Sceloporus clarkii clarkii Cope, Bull. U. S. Nat. Mus., **1**, pp. 49, 92, 1875 (part); Yarrow, U. S. Geog. Surv. W. 100th Mer., **5**, pp. 575–576, 1875 (part); Burt, Trans. Amer. Micr. Soc., **54**, p. 172, 1935 (part); idem, Trans. Kans. Acad. Sci., **38**, pp. 275, 299, 305, 1936 (part); Taylor, Univ. Kans. Sci. Bull., **24**, pp. 477, 483, 1938.

Sceloporus spinosus Yarrow, U. S. Geog. Surv. W. 100th Mer., **5**, pp. 574–575, 1875 (part); Coues, U. S. Geog. Surv. W. 100th Mer., **5**, p. 588, 1875 (part?); Yarrow, Bull. U. S. Nat. Mus., **24**, p. 63, 1883 (part?); idem, Smithson. Misc. Collec., **517**, p. 10, 1883 (part?); Günther, Biol. Cent.-Amer., Rept. Batr., p. 63, 1890 (part).

Sceloporus clarki clarki Coues, U. S. Geog. Surv. W. 100th Mer., **5**, p. 594, pl. 23, fig. 1, 1875 (part); Yarrow, Bull. U. S. Nat. Mus., **24**, p. 63, 1883 (part); idem, Smithson. Misc. Collec., **517**, p. 11, 1883 (part).

Sceloporus couchi Cope, Bull. U. S. Nat. Mus., **17**, p. 47, 1880 (*?lapsus calami* for *clarkii*).

Sceloporus spinosus clarkii Boulenger, Cat. Liz. Brit. Mus., **2**, p. 227, 1885 (part); idem, **3**, p. 503, 1887 (part); Stejneger, N. Amer. Fauna, **7**, p. 181, 1893; Boulenger, Proc. Zool. Soc. Lond. **1897**, pp. 491, 496, 1897 (part); Brown, Proc. Acad. Nat. Sci. Phila., **55**, pp. 546, 552, 556, 1903 (part).

Sceloporus clarkii Bailey, N. Amer. Fauna, **35**, p. 20, 1913; Pratt, Manual Vert. Animals U. S., pp. 198, 199, 1923 (part); Ortenburger and Ortenburger, Proc. Okla. Acad. Sci., **6**, p. 107, 1926; Walls, Copeia, **1931**, p. 127, 1931.

Type locality.—"Province of Sonora" (=southern Arizona). Cotypes USNM 2940 (3); the specimen with a white tag on its leg is designated the lectotype.

Distribution.—Southern and central Arizona (excepting the western part of the state), southwestern New Mexico, and Sonora, with the exception of the extreme western and southern parts (fig. 12).

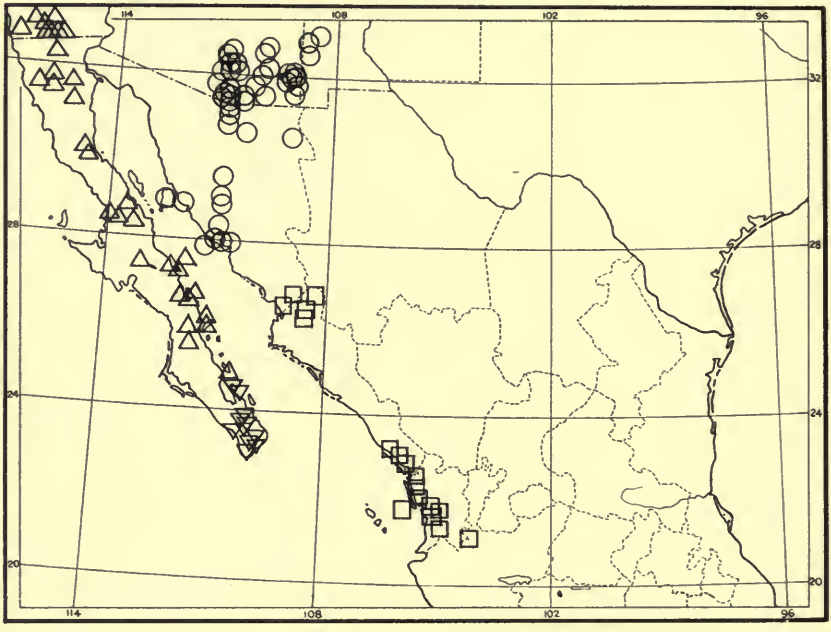

FIG. 12. Distribution of *Sceloporus orcutti orcutti*, △; *S. o. licki*, ▽; *S. clarkii clarkii*, ○; and *S. clarki boulengeri*, □.

History.—The history of *clarkii clarkii* has been discussed under *magister magister*. The lectotype has been designated because the other specimens in the cotype series are *magister magister*. The lectotype apparently had previously been noted to be different from the other specimens, as a white tag has been placed on its leg.

Diagnosis.—A large species of the *spinosus* group, maximum snout-vent measurement 130 mm.; dorsal scales 28 to 36, average 31.8; ventral scales 40 to 54, average 46.3; scales around body 32 to 43, average 37.9; femoral pores usually 11 to 16 (rarely 10, except in the southern part of its range, in Sonora), average 12.3; lateral scales gradually decreasing in size toward venter, none of the upper lateral scales larger than median dorsals; one parietal on each side;

the two posterior supraoculars on each side usually entirely in contact with median head scales; first canthal seldom in contact with lorilabials; outer row of labiomentals rarely in contact with mental; usually three auricular lobules, all short, broad, rounded, the upper much the largest. Back uniform or with narrow, undulate, indistinct bars; nuchal collar narrow, indistinct, frequently broader medially and with an indistinct light border on each side; lower forelimbs with distinct bands; tail with indistinct bands.

Description.[1]—Head scales smooth, flat, pitted around edges; interparietal about one and three-fourths times as large as either parietal; parietal large, single on each side; one small, subrectangular frontoparietal on each side, rarely two; frontoparietals occasionally in contact medially, usually separated by contact of frontal and interparietal; frontal typically divided, the posterior section somewhat smaller than anterior; usually five large supraoculars on each side, the fourth and fifth in contact with median head scales, rarely the fifth partially separated by a small series intercalated along its posterolateral border; a row of small scales between supraoculars and superciliaries, rarely increased to a partially double row, and rarely with small gaps permitting contact of parts of supraoculars with superciliaries; latter usually six, five visible from above; prefrontals usually in contact, separated occasionally by contact of median frontonasal and frontal or, less frequently, by an azygous scale; frontonasals typical, the median about one and one-half times as large as either lateral frontonasal; usually two distinct pairs of internasals; nasal short, in contact with lorilabials; four postrostrals; subnasal small, rarely absent; first canthal rarely in contact with lorilabials; second canthal usually larger than first; preocular entire; usually two complete rows of lorilabials below subocular; subocular relatively short, followed posteriorly by two postoculars; three and one-half to four supralabials and four or five infralabials to a point below middle of eye.

Mental pentagonal, with a labial border about half that of rostral; outer row or labiomentals rarely in contact with mental; about five postmentals on either side, the anterior scale of either series in contact with its fellow medially; gular scales smooth, all notched except those in extreme anterior part; two notches on scales in posterolateral gular region, others with a single apical notch; median posterior gular scales smaller than adjacent scales; scales in posterior lateral gular region mucronate and keeled.

[1] Based on UMMZ 69882, male, Catalina Mountains, Pima County, Arizona.

Usually three auricular lobules, smooth, more or less rounded, the upper the largest; temporal scales weakly keeled, weakly mucronate, denticulate, the largest somewhat smaller than largest scales between ear and lateral nuchal pocket; scales in latter area gradually decreasing in size ventrally, increasing dorsally; a series of very strongly keeled, strongly mucronate scales passing from lower edge of nuchal pocket to a point below ear; scales between nuchal pocket and arm keeled, strongly mucronate, denticulate, the largest subequal in size to largest temporal scales, their keels directed ventrocaudad; scales above arm larger, more strongly mucronate, their keels directed dorsocaudad.

Dorsal scales not strongly keeled, not strongly mucronate, denticulate (with as many as four denticules on either side of median mucrone); dorsals usually in parallel, sometimes slightly convergent rows, the anterior scales smallest, the scales at rump perhaps somewhat smaller than median scales; lateral scales more strongly mucronate, gradually decreasing in size toward venter, the median laterals about one-half size of median dorsals; ventral scales smooth, the median scales about two-thirds size of median lateral and lateral chest scales, larger than preanal scales; scales on sides of belly and chest, and in gular region, with two apical notches, others with one notch; anterior preanal scales with one notch, posterior scales entire.

Dorsal scales of foreleg mucronate, keeled, denticulate, more or less subequal in size, about one-third or one-fourth size of median dorsal scales on body; scales on anteroventral surface of lower foreleg smooth, denticulate, those on posteroventral surface keeled; ventral scales of lower foreleg somewhat smaller than dorsal scales of same member; scales on ventral surface of upper foreleg smooth, notched, gradually increasing in size distally and merging with ventrals of lower foreleg; lamellar formula for fingers 8–11–15–16–11.

Dorsal scales of hind leg keeled, mucronate, denticulate, those on shank somewhat larger than those on thigh, and about one-half size of median dorsal scales on body; scales on lower anterior surface of thigh smooth, notched, becoming smaller on ventral surface toward series of femoral pores; the two series of femoral pores separated medially by about eight scales; scales on posterior surface of thigh keeled, mucronate, denticulate, the keels directed upward, the median scales subequal in size to preanal scales; scales on ventral surface of shank smooth, notched, about two-thirds size of dorsal scales of same member; lamellar formula for toes 7–11–17–20–13 (8–11–17–20–14).

Dorsal caudal scales keeled, mucronate, denticulate, the basal scales somewhat larger than dorsal scales on body; subcaudals smooth and entire except toward tip of tail, where they become keeled, weakly mucronate and denticulate; subcaudals immucronate in females; postanals enlarged in males; no postfemoral dermal pocket.

Color.—General dorsal ground color in males dark brown to gray brown; light flecks or irregular indistinctly outlined lighter areas scattered over back and sides; an indistinct dark neck band present, broader medially, usually with an indistinct light posterior border, occasionally with a light anterior border; a large irregular bluish or white area in middle of black shoulder patch, sometimes so large as almost to obliterate the black area; flecks of bluish on scales on sides of neck; narrow dark brown lines occasionally present, following the edges of the lateral scale rows; a narrow dark line, sometimes with an incomplete upper or lower light border, passing from posterior edge of orbit below middle, above ear and to nuchal collar; dorsal surface of tail frequently with numerous vague light blue areas, giving it a bluish cast; tail usually not distinctly barred; limbs with dark gray or dark brown bands, each band with a distinct distal border, but an indistinct proximal border; bands on foreleg very characteristic, more distinct distally; digits barred.

The coloration in life is described by Ruthven (1907): "In the males the inferior surface of the limbs and breast, and a narrow band along the middle of the belly, are yellow; the sides of the belly are bright blue, and there is on the throat a spot of very intense blue that fades out to a white or gray anteriorly." Ventral surface of tail sometimes bluish; throat not barred.

Females similar to males, except nuchal collar less distinct or absent on back; narrow undulate dark gray or brown crossbars on back, about four or five in number, each bordered posterolaterally by a rather large irregularly outlined light spot; the tail is more distinctly barred than in males; the ventral surfaces are mostly white or cream; sides of belly frequently with some evidence of bluish markings similar to those in males, but much less distinct; gular region with distinct convergent dark brown bars; center of gular area with a large area of pale blue, gradually becoming white anteriorly.

MacCoy (1932), referring to specimens collected near Tucson, Arizona, states that "a large, adult female, which has a green spot in the center of each dorsal scale, is decidedly green above."

Variation.—The following data on variation in cephalic scutellation is based on 72 specimens, unless otherwise stated. Parietals

usually one on each side (212 counts: one, 208; two, 4); frontoparietals divided into two on one side in two; frontoparietals contacting medially in 11, fused with frontal in five; frontal contacting interparietal in 46, separated by an azygous scale in 18; posterior section of frontal transversely divided in one; prefrontals contacting medially in 47, separated by an azygous scale in seven, by contact of median frontonasal and frontal in 16; first and second canthals fused in one; first canthal fused with subnasal in two; first canthal in contact with lorilabials on both sides in five, on one side in five (178 specimens); preocular divided in none; lorilabials in two complete rows below subocular on both sides in 47, on one side in seven, on neither side in 18 (reduced to one row by one or more scales contacting both subocular and supralabials); first pair of postmentals normally contacting medially, separated in four; outer row of labiomentals in contact with mental on one side in four, on both sides in four, on neither side in 169.

Dorsal scales 28 to 36, average 31.8 (105 counts: 28, one; 29, nine; 30, thirteen; 31, twenty-four; 32, twenty-seven; 33, fifteen; 34, seven; 35, seven; 36, two); ventral scales 40 to 54, average 46.3 (40, two; 41, one; 42, six; 43, ten; 44, five; 45, fifteen; 46, fourteen; 47, sixteen; 48, eleven; 49, thirteen; 50, six; 51, three; 52, one; 54, one); scales around body 32 to 43, average 37.9 (32, one; 33, two; 34, two; 35, eleven; 36, ten; 37, sixteen; 38, fifteen; 39, eighteen; 40, thirteen; 41, twelve; 42, three; 43, one). Femoral pores 10 to 16, average 12.3 (370 counts: 10, thirteen; 11, fifty-seven; 12, one hundred and sixty; 13, one hundred and five; 14, twenty-eight; 15, five; 16, two).

All the specimens with 32 to 34 scales around the body are from Sonora. Specimens with 10 femoral pores are predominately from Sonora; nine of the 13 counts of 10 are from Sonora, and four are from Tucson and the Huachuca Mountains.

Habits and habitat.—There appears to be some disagreement in published notes on the habitat preferred by *c. clarkii*. According to some authors, trees are preferred; according to others, boulders. In certain localities, where trees are rare, the species would find it necessary to live elsewhere, and boulders or rocky areas seem to be preferred to open desert. According to Dr. Edward H. Taylor's observations, in areas in which *m. magister* and *c. clarkii* occur together, the habitats are different, the former occupying the desert floor and boulders, and *c. clarkii* the trees. In areas where *m. magister* does not occur, *c. clarkii* extends its habitat to include boulders. It apparently

finds the desert floor unsuitable. In this case, *m. magister* seems to be much more restricted in its habitat preference, and maintains its preference regardless of competition of *c. clarkii*, while the latter is less restricted and can avoid too great competition with *m. magister* by entering a different ecological niche.

Several authors have remarked on habitats in specific localities. Ruthven (1907) states: "In contrast to *S. magister*, which occurs on the plains, the habitat of *S. clarkii* is limited to the timber zone along the streams (Willow-Poplar association), and in harmony with the different conditions under which it lives its habits also differ from those of the desert form. It is found only on or near trees, and when surprised does not dash down a hole as would *S. magister* under the same circumstances, but up and around the trunk, keeping on the far side of the tree like a squirrel. It is thus more arboreal in its habits than *S. magister*, a fact that determines its local distribution, for trees on the desert are confined to the larger water courses, the higher elevations on the mountains, and the bottoms of the cañons. Near Tucson *Sceloporus clarkii* occurs along the Santa Cruz River and Rillito Creek, following the tributaries of the latter into the cañons which they have carved out of the south slope of the Santa Catalina Mountains. In the lower part of Sabino Cañon I observed several individuals among the trees and bushes with *Cnemidophorus gularis*, and they seemed quite as willing when frightened to take refuge beneath the stones that strew the bottom of the gorge as to run up the trees."

Van Denburgh and Slevin (1913) record: "At Oracle these lizards were found in cracks in the granite boulders. The one from Mt. Lemon was also taken on a boulder. Nearly all the others were found on trees—at Tucson on willows along the Santa Cruz River, in the foothills of the Catalinas on mesquites, in the Huachucas and Chiricahuas on oaks and pines. Those taken at Fairbank were under the eaves of an old adobe barn. They sometimes climb trees to a height of thirty or forty feet."

Ortenburger and Ortenburger (1926, p. 107) state, regarding specimens from Steam Pump Ranch, 13 miles north of Tucson, foot of Santa Catalina Mountains: "In no case were they found on the desert floor; all of them were at least a mile up one of the several canyons of the mountains. All except one were seen on the sides of large boulders. In some cases, especially in the cool early morning, they were found in the cracks formed by exfoliation of the huge boulders, the stone evidently retaining some of the heat of the sun-

shine of the day before. In only one case was a specimen seen on vegetation, and then it was on the trunk of a dead palo verde tree, head down and about one foot from the ground."

Ruthven (1907) and MacCoy (1932) record the stomach contents of four specimens. All organic matter consisted of insects, including caterpillars, an ant, two grasshoppers and several beetles.

Locality records.—NEW MEXICO.—CATRON CO.: Pleasanton (USNM 44943); 2½ to 5 mi. N of Glenwood (KU 6489–98, 6500–5, 12299–302, 13125–33, 14913). GRANT CO.: Redrock (USNM 44951); East Canyon (LMK 26085, 26100, 26116–7); 4 mi. N of Silver City (MVZ 7055). HIDALGO CO.: Lordsburg (KU 15305–11). SIERRA CO.: below Hermosa (UMMZ 60037); Elephant Butte Dam, Cuchillo (UMMZ 60039). SOCORRO CO.: (KU 7000–1). ARIZONA.—COCHISE CO.: Huachuca Mts. (KU 7040, 7090, 12303–4, 12309–12, 12334–9; FMNH 2582; MCZ 14857–63, 29761–5; AMNH 20510, 14901–9, 14911–24, 14926, 14929–35, 14948, 14974, 18639–40, 10643, 18700; CAS 34882–7, 34889–93, 48454–77; LSJU 653–4, 656); Montezuma Canyon (UMMZ 53981); Ash Canyon (UMMZ 69871–2; LMK 1639–41); Carr Canyon (UMMZ 69879, 69880[2], 69883; SDSNH 14797–8); Ft. Huachuca (UMMZ 71768[2]; USNM 17782, 19684–6, 21113–4, 22218–22); Miller Canyon (UMMZ 72610–1; SDSNH 14784, 14802); Ramsey Canyon (MCZ 29839–43; SDSNH 14785–96, 14850–1); ridge between Carr and Ramsey canyons (SDSNH 14799–801); Bisbee (USNM 24463; AMNH 290–5); 6 mi. N of Bisbee (UMMZ 69878[2]); 56 mi. N of Bisbee (UMMZ 69870); 8 mi. N of Charleston (UMMZ 69873); Dos Cabezas (UMMZ 71111–3; MVZ 13843); Tombstone (FMNH 918, 1139–40); 4 mi. S of Tombstone (AMNH 36860); 15 mi. W of Tombstone (LMK 4894–6); Portal (USNM 93070–2); Apache (USNM 8494[2]); Rio San Pedro (USNM 20563); Boundary Monument 77, San Bernardino Ranch (USNM 21030); 12 mi. N of Willcox (USNM 44572); Chiricahua Ranch (USNM 54658); Chiricahua Mts. (LSJU 2156); Whitetail Canyon (MVZ 7783–8); Spud Rock Ranger Station (SDSNH 16109); Pinery Canyon (SDSNH 15787–8; MVZ 7782, 7789); Rucker Canyon (LSJU 2118, 2158–60, 2677, 2697); Camp Rucker (USNM 64637); Riggs Home Ranch, Sulphur Springs Valley (MVZ 7790); Fairbank (CAS 35179–83); Paradise (CAS 35005–17); Cave Creek (CAS 35141). GILA CO.: McMillanville (USNM 54597, 54676); Miami (KU 12305–8); Salt River (USNM 54598); San Carlos (USNM 16023). GRAHAM CO.: Fort Grant (USNM 31632); Mt. Graham (USNM 51755–6); Stanley (MVZ 12875). GREENLEE CO.:

2 mi. below Blue (UCLA 573); Clifton (USNM 51897–9); Eagle Creek (Quaintance, 1935). MARICOPA CO.: Cave Creek (KU 12326–33); Fish Creek (USNM 54651); Phoenix (KU 10837–8). PIMA CO.: (AMNH 26740, 26719–22); Tucson (UMMZ 65091[2], 64079[5], 64081[4]; MCZ 32130–4; USNM 16961–3, 15745, 16826, 62513, 16935–6, 17240–4; AMNH 2555–6, 2723, 2574–5, 26723; ANSP 11878; SDSNH 11337; CAS 33805–7, 34055–6, 34058–60, 34039–53, 48479–82); 16 mi. N of Tucson (KU 12313–6); 30 mi. S of Tucson (KU 13134–8); Tucson Mts. (AMNH 2497); Steam Pump (AMNH 26694, 26700–2, 26704–6, 26709, 26711, 26714–6); Santa Catalina Mts. (KU 6945, 6951, 7253–4, 12317–24, 15527–43; CAS 34294–301, 34304–8, 34315, 34317, 34685, 48478; UMMZ 69877, 69874); Sabino Canyon (AMNH 453–4; UMMZ 60035–6; SDSNH 14803–10); Cañada del Oro (UMMZ 69875); Kelly Ranch, W end of Catalina Mts. (UMMZ 69881, 69882[7]); Ft. Lowell (FMNH 664; CAS 20951–2; LSJU 643, 645–8, 802, 2143–4, 2149, 2518, 2521–2, 2524, 2526–7, 2542–3, 2563–4, 2566–9, 2571–3); Rincon Mts. (FMNH 2583); Tanque Verde Ranch (SDSNH 16110–22); Santa Rita Mts. (CAS 48413–53); (?)Baboquivari Mts. (Stone, 1911). PINAL CO.: (USNM 61438); Oracle (LMK 22880–2; CAS 34167–8); Camp Bonito, 8 mi. S of Oracle (UMMZ 69876); Pepper Sauce Canyon, 8 mi. SE of Oracle (UMMZ 72612). SANTA CRUZ CO.: Peña Blanca Springs (UMMZ 75754[3], 75755–60, 75761[2], 75766; MVZ 20537–8); Tumacacori Mts. (USNM 15748; LMK 5706–7); Mowry, Patagonia Mts. (CAS 33819–23); Santa Rita Range Reserve (USNM 62512); Madera Canyon, Santa Rita Mts. (USNM 61384); Tubac (SDSNH 14811–2, 14821–2, 14824–33, 14835–6, 14838, 14842); Nogales (FMNH 21514); Crittenden (USNM 8484–5). YAVAPAI CO.: Fort Verde (AMNH 1345, 1356–8); Congress Junction (USNM 54663); Montezuma Well (USNM 59794); Jerome (USNM 59800); Beaver Creek (USNM 25479); Yarnell (LMK 8374).

SONORA.—Nogales (USNM 46840); 32 mi. S of Nogales (USNM 17250–1); 53 mi. S of Nogales (EHT 8343A, 8343–4); 30 mi. S of Noria (EHT 8345); 5 mi. SW of Hermosillo (EHT 8346); 15 mi. N of Hermosillo (EHT 8366; UMMZ 72112–3); 54 mi. SW of Hermosillo (EHT 8347); Guaymas (USNM 13486; LMK 4067); 10 mi. NW of Guaymas (EHT 8348–52); Miramar (EHT 8353–8364); Empalme (EHT 8365); Costa Rica Ranch (MCZ 36883); below Santa Maria Mine, El Tigre Mts. (UMMZ 78413); Pilares (UMMZ 78397[6], 78398[4], 78399[3], 78400[2], 78401[3], 78402[2], 78403[2], 78 (UMMZ 78397–412[43]); Oposura Mts. (MCZ 6763); Kino Bay (SDSNH 16694);

San Pedro Nolasco Island (LMK 6846; CAS 50516–26); San Pedro Bay (CAS 53413–7); Tiburon Island (Van Denburgh, 1922).

Sceloporus clarkii boulengeri Stejneger.

Sceloporus spinosus Boulenger, Cat. Liz. Brit. Mus., **2**, pp. 217, 266–267, 1885 (part); Günther, Biol. Cent.-Amer., Rept. Batr., pp. 63–64, 1890 (part); Boettger, Kat. Rept. Senck. Mus., p. 64, 1893.

Sceloporus boulengeri Stejneger, N. Amer. Fauna, **7**, p. 180, pl. 1, figs. 5 *a–c*, 1893; Van Denburgh, Proc. Calif. Acad. Sci., (2), **6**, p. 341, 1896; idem, Proc. Acad. Nat. Sci. Phila., **1897**, p. 463, 1898; Stejneger, N. Amer. Fauna, **14**, p. 67, 1899; Slevin, Proc. Calif. Acad. Sci., (4), **15**, p. 199, 1926; Van Denburgh and Slevin, Proc. Calif. Acad. Sci., (4), **4**, pp. 132, 148, 1914.

Sceloporus spinosus spinosus Boulenger, Proc. Zool. Soc. Lond., **1897**, pp. 491, 494, 496, 1897 (part).

Sceloporus clarkii boulengeri Burt, Trans. Amer. Micr. Soc., **54**, pp. 171–172, 1935 (part); idem, Trans. Kans. Acad. Sci., **38**, p. 275, 1936; Taylor, Kans. Univ. Sci. Bull., **24**, pp. 507, 520, 1938.

Type locality.—Presidio, about fifty miles from Mazatlán, Sinaloa, Mexico. Three cotypes, USNM 14079, collected by A. Forrer.

Distribution.—Extreme southern Sonora, southward on the Pacific slopes to northern Jalisco (fig. 12).

Diagnosis.—A large species, maximum snout-vent measurement 120 mm.; essentially similar to *clarkii clarkii* in scutellation; femoral pores 8 to 11, average 9.1; lorilabials usually not reduced to one row below subocular; frontoparietals frequently in contact medially.

Description.[1]—Head scales smooth, pitted; interparietal relatively small, pentagonal; parietals single on either side, subtriangular, two-thirds or three-fourths size of interparietal; frontoparietals small, broadly in contact medially; posterior section of frontal one-fourth or one-fifth size of anterior section; prefrontals slightly less than half size of anterior section of frontal, broadly in contact medially; three frontonasals, the median somewhat larger than others, the lateral scales subequal in size to either prefrontal, in contact with both canthals; two large pairs of internasals, the anterior pair separated from nasal by a series of small scales, both pairs separated from first canthal by a single small scale; supraoculars five–five, the anterior the smallest, the others subequal in size, the third slightly larger; a series of small scales between supraoculars and median head scales extending from second canthal slightly beyond suture between fourth and fifth supraoculars; a small scale intercalated between last supraocular and parietal, at the extreme outer edge;

[1] Based on EHT 681, male, topotype.

first supraocular in contact with first superciliary; a series of small scales intercalated between superciliaries and supraoculars extending from posterior edge of first supraocular to posterior edge of fifth; five superciliaries visible from above; two canthals, the second forming a small portion of the superciliary ridge, the first not touching the lorilabials; subnasal small; nasal in contact with lorilabials, separated from rostral; preocular completely divided on one side, only partially divided on other (abnormal); two canthals on one side, irregular on other; subocular normal; two strongly keeled postoculars following subocular posteriorly; two rows of lorilabials, not reduced to one below subocular; four supralabials and five infralabials to a point below middle of eye.

Mental subtriangular, with a labial border two-thirds that of rostral; three pairs of fairly well-differentiated postmentals, the scales of the anterior pair in contact medially; outer row of labiomental scales separated from mental by partial contact of first infralabial and first postmental; inner row of labiomentals absent (abnormal); gular scales subequal in size, smaller anteriorly, with one or two (usually one) apical notches; scales below ear with weak keels, somewhat mucronate; scales in gular fold region usually with two apical notches.

Auricular lobules three–four, the upper the largest, all smooth, somewhat acuminate; largest auricular lobule subequal in size to largest of preceding scales; temporal scales very weakly keeled, not or very weakly mucronate, somewhat smaller than largest scales between ear and lateral nuchal fold; scales surmounting lateral nuchal pocket keeled and strongly mucronate, these scales extending along a ridge continuous to a point below ear opening; scales between lateral nuchal fold and arm insertion mucronate, denticulate, very weakly keeled, somewhat larger than gular scales.

Scales on nape weakly keeled, weakly mucronate, somewhat smaller in size than those following them; dorsal scales keeled, rather strongly mucronate, denticulate, in convergent rows; lateral scales in diagonal rows, about one-half size of, and more strongly keeled, mucronate and denticulate than dorsal scales; ventral scales smooth, with one or two apical notches, about one-half or two-fifths size of dorsal scales; scales in interfemoral region reduced in size, somewhat larger than or subequal in size to preanal scales; latter not notched; scales on chest somewhat larger than following scales; dorsal scales on rump somewhat larger than preceding scales; basal caudals on dorsal surface approximately as large as dorsal scales

on body, strongly keeled and mucronate, weakly denticulate, becoming smaller distally; subcaudals smooth and rounded at base of tail, becoming keeled and weakly mucronate toward tip of tail; enlarged postanal scales present, separated from each other by two small scales.

Dorsal scales of foreleg weakly keeled, mucronate, weakly denticulate, those on upper foreleg about one-half size of dorsal scales on body, one-third larger than dorsals on lower foreleg; dorsal scales on elbow greatly reduced in size, approximately one-third or one-fourth size of scales on lower foreleg; ventral scales of lower foreleg subequal in size to dorsal scales of same member, notched, smooth anteriorly, keeled posteriorly and toward hand; ventral scales of upper foreleg smooth, notched, very small toward axilla, increasing in size toward lower foreleg; lamellar formula for fingers 9–12–16–18–12 (9–13–15–18–13).

Dorsal scales of shank and thigh subequal in size, about as large as dorsal scales of upper foreleg, keeled, mucronate, not or weakly denticulate; scales at knee smaller; ventral scales of shank subequal in size to dorsal scales of same member, rounded, smooth, becoming keeled toward foot; scales on anterior surface of thigh very weakly keeled and mucronate, becoming smooth, rounded and smaller toward series of femoral pores; all scales on posterior surface of femur much smaller than preanal scales, those in a central area keeled and mucronate; lamellar formula for toes 8–12–18–20–14 (8–12–18–20–15).

Color.—The coloration is much as in *clarkii clarkii*. Females are most distinctively marked. The black collar is present, not confluent ventrally, but frequently complete dorsally. Usually the collar is about one scale wide, but may be broader, with a light posterior edge on middle of back. The collar is confluent with a median dark band three and two half scale rows wide, which passes onto the tail. The edges of the median band may be emarginate, with light borders on the posterior oblique edges of the emarginations. A tan-colored band about two half scale rows wide passes from the collar along each side of the median dark band onto the tail. Lateral to this on each side is a dark band similar in color to the median band, passing from above the axilla to the groin. Below this is another tan band, sometimes broken irregularly, passing from the axilla to the groin, and below this is still another dark, slate-colored band merging ventrally with the cream color of the abdomen. The head is straw color. The throat is slate-colored, with a light to dark blue central gular area, with a lighter medial streak about two scales

wide. The limbs have transverse bands dorsally of slate and straw color, the lighter bands the narrower, and the darker bands with their distal edges more distinct than their proximal edges. The tail is faintly or distinctly banded with the same colors.

Males have a more or less similar coloration when young, but later in life become more or less uniform light straw color above. Dark blue lateral abdominal areas are present, bordered medially by black areas confluent medially and extending into the groin. The throat is black, except for the cream-colored mental region, with a large median blue spot. The black shoulder patches may or may not unite dorsally, but are always confluent ventrally.

Variation.—The variation in scutellation of the head in 52 specimens (unless otherwise stated) is as follows: parietal single in all; frontoparietals single in all, in contact medially in 16, separated by an azygous scale in eight; frontal in contact with interparietal in 27; posterior section of frontal longitudinally divided in one, anterior section divided into three scales in one, into two scales in one; superciliaries five to seven (36 counts: 5, one; 6, thirty-three; 7, two); supraoculars four to six (36 counts: 4, one; 5, thirty-two; 6, three); only last supraocular in contact with median head scales in 28, last two in 46, last three in two (76 counts); prefrontals in contact in 27, separated by an azygous scale in six, by contact of median frontonasal with frontal in five (36 counts); median frontonasal separated from lateral frontonasals on one side in one, normal in others; two pairs of internasals in 18 counts; canthals fused on both sides in seven, on one side in one (38 counted); first canthal forced above canthal ridge by contact of subnasal and second canthal on both sides in eight, on one side in five (38 counts); preocular divided on both sides in three, on one side in one (38 counts); two loreals present on both sides in three, none in one (by fusion with first canthal on one side, with subnasal on other) (38 counts); four postrostrals in 18 out of 52; two complete rows of lorilabials below subocular on one side in five specimens, on both sides in 39; lorilabials reduced to a single row below subocular by a single scale in contact with both subocular and supralabials on one side in five, on both sides in eight (52 counts); outer row of labiomentals in contact with mental in none.

Dorsal scales 27 to 32, average 29.8 (52 counts: 27, two; 28, seven; 29, eleven; 30, eighteen; 31, nine; 32, five); ventral scales 39 to 51, average 44.2 (34 counts: 39, one; 40, two; 41, three; 42, seven; 43, two; 44, three; 45, eight; 46, two; 47, two; 50, two; 51,

two); scales around body 31 to 41, average 34.4 (35 counts: 31, one; 32, five; 33, seven; 34, eight; 35, six; 36, three; 37, two; 38, two; 41, one). Femoral pores 8 to 11, average 9.1[1] (181 counts: 8, thirty-nine; 9, eighty-five; 10, fifty-two; 11, five).

There is little geographical correlation in the above data. Specimens from Isabel Island show a strong tendency to have a single row of lorilabials below subocular (17 out of 18 counts), while specimens from the mainland show a very slight tendency (10 out of 86 counts). In the absence of other corroborative evidence of subspeciation, it appears wisest to regard these populations as the same subspecies.

Specimens from the southern part of the range show a smaller average number of femoral pores, but the maximum number, 11, is well scattered throughout the range. Specimens with this count have been examined from Hostotipaquillo, Isabel Island, Mazatlán and San Francisquito.

Comparison.—S. clarkii boulengeri is most closely related to *clarkii clarkii*, from which it differs in certain characters of coloration, and in three scale characters, of which the femoral pore count is the most significant.

	c. boulengeri Per cent	*c. clarkii* Per cent
Pores 10 or less	97.2 (181)	3.8 (370)
Frontoparietals contact medially	30.8 (52)	15.3 (72)
Two complete rows of lorilabials below subocular	79.9 (104)	70.1 (144)

Females of *c. boulengeri* differ from those of *c. clarkii* in having the femoral pores decreasing in size distally; frequently the distal pores are very indistinct, while the proximal three or four are very distinct, and careful examination is necessary to discern the actual number.

Habits and habitat.—Slevin (1926, p. 199) states that this subspecies is "abundant on Isabel Island and found mostly on the small trees back of the landing place. It is strictly an arboreal species and in habits resembles *Sceloporus clarkii*, its northern relative."

Locality records.—SONORA: Alamos (MCZ 1) Agiabampo (LMK 4069). SINALOA: (AMNH 1366–71); Mazatlán (AMNH 20680–90, 20716–7, 15499–509; USNM 51382–3; LMK 7337–41; LSJU 2895–901, 2903–4, 2910, 2913–9, 2923, 3523); 9 mi. S of Mazatlán (EHT 8378–84); 1 mi. E of Mazatlán (EHT 8385); Presidio, 50 mi. S of Mazatlán (EHT 8367–77, 8386; USNM 14079[3]); San Francisquito (AMNH 15494); Rincón de Urias (AMNH 20714–5, 20691–2); Escuinapa (AMNH 15534); Mocorito (MCZ 27084); Sierra de Choix

[1] Part of these data taken from Slevin (1926).

(USNM 47418); Bacubirito (USNM 33574–6); Rosario (USNM 47679–80); Los Mochis (USNM 56856). NAYARIT: Rosamorada (AMNH 15498, 19351–3, 19355); Puerta Azul, E of Santiago Escuintla (AMNH 19354); N of Santiago Escuintla (AMNH 19052); Isabel Island (MCZ 22548; USNM 24646–51, 71669–70; UMMZ 70789; LMK 26780, 7332–4, 10125–9; CAS 59073–153); Tepic (Van Denburgh, 1897); Acaponeta (USNM 47673–5). JALISCO: W brink of Arroyo Hondo, Hostotipaquillo (AMNH 15519).

Sceloporus orcutti orcutti Stejneger.

Sceloporus orcutti Stejneger, N. Amer. Fauna, **7**, p. 181, pl. 1, figs. 4 *a–c*, 1893; Boulenger, Proc. Zool. Soc. Lond., **1894**, p. 724, 1894; Van Denburgh, Proc. Calif. Acad. Sci., (2), **5**, pp. 83, 113, 1895; Cope, Amer. Nat., **30**, p. 1017, 1896; Van Denburgh, Proc. Calif. Acad. Sci., (2), **5**, pp. 1004, 1005, 1896; Boulenger, Proc. Zool. Soc. Lond., **1897**, pp. 488–489, 1897; Van Denburgh, Occ. Papers Calif. Acad. Sci., **5**, pp. 13, 15, 74, 86–89, 1897; McLain, Collec. Herp. Western Coast U. S., p. 8, 1899; Cope, Ann. Rept. U. S. Nat. Mus., **1898**, pp. 354–356, 1900; Meek, Field Mus. Nat. Hist., Zool. Ser., **7**, p. 11, 1905; Ditmars, Rept. Book, pp. 128, 133–134, 1907; Mearns, Bull. U. S. Nat. Mus., pt. 1, **56**, pp. 133, 138, 1907; Van Denburgh, Proc. Calif. Acad. Sci., (4), **3**, pp. 149, 150, 151, 152, 1912; Atsatt, Univ. Calif. Publ., Zool., **12**, pp. 37–38, 46, 47, 48, 49, 1913; Grinnell and Camp, Univ. Calif. Publ., Zool., **17**, p. 163, fig. 7, 1917; Stejneger and Barbour, Check List N. Amer. Amph. Rept., p. 56, 1917; Hall and Grinnell, Proc. Calif. Acad. Sci., (4), **9**, p. 54, 1919; Stephens, Trans. San Diego Soc. Nat. Hist., **3**, p. 62, 1921; Van Denburgh and Slevin, Proc. Calif. Acad. Sci., (4), **11**, pp. 51, 61, 1921; Nelson, Mem. Nat. Acad. Sci., **16**, pp. 114, 130, 1922; Schmidt, Bull. Amer. Mus. Nat. Hist., **46**, pp. 662–663, 1922; Van Denburgh, Occ. Papers Calif. Acad. Sci., **10**, pp. 352–356, pl. 28, 1922; Stejneger and Barbour, Check List N. Amer. Amph. Rept., 2nd ed., p. 58, 1923; Klauber, Copeia, **1926**, p. 116, 1926; idem, Zool. Soc. San Diego, Bull. **4**, p. 3, 1928; Burt and Burt, Jour. Wash. Acad. Sci., **19**, p. 452, 1929; Klauber, Copeia, **1929**, p. 17, 1929; Bogert, Bull. S. Calif. Acad. Sci., **19**, p. 7, 1930; Klauber, Zool. Soc. San Diego, Bull. **5**, p. 3, 1930; idem, **8**, pp. 47, 75, 80, 1931; Wright and Wright, Copeia, **1931**, p. 84, 1931; Linsdale, Univ. Calif. Publ. Zool., **38**, p. 367, 1932 (part); Burt, Amer. Mid. Nat., **14**, p. 238, 1933; Stejneger and Barbour, Check List N. Amer. Amph. Rept., 3rd ed., p. 64, 1933; Klauber, Zool. Soc. San Diego, Bull. **11**, p. 12, 1934; Slevin, Handb. Rept. Amph. Pacif. States, pp. 44, 52, 1934; Burt, Trans. Kans. Acad. Sci., **38**, pp. 276, 277, 299, 305, fig. 61, 1936; Ditmars, Rept. N. Amer., p. 47, 1936.

Sceloporus digueti Mocquard, Nouv. Arch. Mus. Hist. Nat. Paris, (4), **1**, pp. 311–313, pl. 13, figs. 2, 2 *a*, 2 *b*, 1899—Santa Rosalia, Lower California.

Sceloporus magister rufidorsum Linsdale, Univ. Calif. Publ., Zool., **38**, p. 366, 1932 (part).

Type locality.—Milquatay Valley, San Diego County, California. Type USNM 16330, collected by C. R. Orcutt.

Distribution.—California, from southern San Bernardino County southward into Lower California to the Sierra de la Gigantea, and on some adjacent islands in the Gulf of California (fig. 12).

Diagnosis.—A species of moderate size, maximum snout-vent measurement 109 mm.; dorsal scales 29 to 36, average 32.3; ventral scales 36 to 44, average 40.6; scales around body 29 to 37, average 33.6; femoral pores 10 to 15, average 13.1; labiomental scales separated from mental; first canthal usually touching lorilabials; auricular lobules five or six, rounded, notched (pointed in Lower California specimens), the median ones not distinctly longer or larger than the upper ones; dorsal scales very weakly keeled, in convergent rows, with a relatively deep notch on either side of the short terminal mucrone; caudal scales very strongly mucronate, weakly keeled (except distally); supraoculars five, the last two in contact with median head scales; usually two complete rows of lorilabials below subocular. Adult males usually with one or more light spots on each scale on back and sides; belly and throat in adult males entirely bluish; young and females with broad brown bands on back, separated by narrow light bands.

Description.[1]—Head scales smooth, pitted; two parietals, the posterior narrow, the anterior subtriangular; interparietal pentagonal, about twice as large as either anterior parietal; frontoparietals single on each side; frontal usually touching interparietal, seldom separated by an azygous scale or by contact of frontoparietals; frontal normally divided; six superciliaries, five visible from above; five supraoculars, the fourth and fifth in contact with median head scales; row of scales between supraoculars and median head scales terminating at suture between third and fourth supraoculars; a single scale inserted at posterior margin of fifth supraocular; one complete row of small scales between supraoculars and superciliaries, occasionally with one or two extra scales; prefrontals in contact; frontonasals typical; nasal separated from rostral by three or four, usually four, postrostrals; internasals irregular or in two or three pairs, the scales sometimes variously fused; subnasal usually present, sometimes absent; canthals two; first canthal usually touching lorilabials; usually lorilabials reduced to one row below subocular by one scale in contact with both subocular and supralabials; two rows of lorilabials in loreal region; one loreal; preocular entire; two strongly keeled postoculars; four supralabials and four and one-half infralabials to a point below middle of eye.

[1] Based on UMMZ 57500, male, Campo, San Diego County, California.

Mental pentagonal, with a labial border about two-thirds that of rostral; four or five pairs of postmentals, the scales of the anterior pair in contact medially, the others separated; outer row of labiomentals separated from mental by partial contact of first postmental and first infralabial; most of gular scales with a single notch, the posterior ones more strongly notched, the anterior scales weakly notched or entire; median posterior and lateral gular scales, except those immediately below ear and near angle of jaws, somewhat larger than others; some of scales in gular fold region with two notches.

Auricular lobules usually five, usually elongate, extending over ear, pointed, smooth, the median ones largest, larger than preceding scales; temporal scales very faintly keeled or smooth, mucronate, denticulate, smaller than scales between ear and lateral nuchal pocket; latter scales strongly mucronate and denticulate, keeled toward their apices; lower scales between arm and nuchal pocket strongly notched, denticulate, the upper scales becoming strongly mucronate and weakly keeled toward apex.

Dorsal scales not or weakly mucronate, strongly denticulate, smooth or very weakly keeled, in convergent rows; lateral scales strongly mucronate, weakly keeled toward apices, about two-thirds or three-fourths size of dorsal scales; ventral scales smooth, notched, some toward sides of belly with two notches; preanal scales smaller than abdominal scales, rounded.

Dorsal scales of foreleg strongly mucronate, strongly denticulate, keeled toward apex, subequal in size (except those on hand), about one-half size of dorsal scales on body; scales on ventral surface of lower foreleg about two-thirds size of dorsals of same member, those toward anterior surface smooth; scales in axilla very small, gradually increasing in size on upper forearm toward lower foreleg; ventral scales of upper foreleg smooth, notched; lamellar formula for fingers 9–13–17–18–12 (8–12–16–17–12).

Dorsal scales of hind leg strongly mucronate, denticulate, keeled toward apex, those on shank and thigh subequal in size, somewhat larger than dorsal scales of foreleg; scales on lower anterior and ventral surfaces of thigh smooth, notched, decreasing in size toward series of femoral pores; scales on posterior surface of thigh strongly keeled, the keels directed upward, largest medially, the largest somewhat larger than preanal scales; ventral scales of shank smooth, notched, as large as dorsal scales of same member; lamellar formula for toes 7–12–19–20–15.

Dorsal scales of tail very strongly mucronate, denticulate, weakly keeled, subequal in size to dorsal scales on back; ventral scales smooth except near tail, irregularly notched; postanals enlarged in males; no postfemoral dermal pocket.

Color.—General ground color in males coppery; a blue spot in the center of each scale on back, neck, limbs, sides of body, neck, and head; scales on sides of body with an additional small blue spot on each side of the larger median spot; a light yellowish spot on most dorsal head scales; a black shoulder patch, with some small, bluish spots scattered through it; entire ventral surface of head, body, and limbs cyanine blue; most of the scales of the throat and abdomen edged with black or rusty brown; the dark edges of the gular scales extensive, reducing the central blue area to small size; ventral surface of tail bluish.

Females variable in dorsal color pattern; usually more or less of a banded pattern evident; some with very distinct alternating light and dark bands, the lighter bands somewhat narrower; limbs and tail frequently distinctly banded, the light bands with a bluish tinge. Ventral surfaces immaculate, sometimes with faint bands across the abdomen and tail, the bands confluent with the dorsal bands; ventral surfaces sometimes tinged with pale blue.

Young with numerous alternating dark and light brown bands, much as in females.

Specimens from the southern part of the range of *o. orcutti* are less distinctly barred in the females and young, and the males are less spotted.

Variation.—The variation in cephalic scutellation of 51 specimens is as follows: two parietals on each side in all; frontoparietals single in all; frontal touches interparietal in 35, separated by an azygous scale in eight, by contact of frontoparietals in eight; frontal entire in one; superciliaries five to seven (5, four; 6, forty-three; 7, four); six supraoculars on one side in two, five in others; two posterior supraoculars contact median head scales in all except one, in which all except the first are in contact; prefrontals in contact medially in all but one, in which an azygous scale separates them; frontonasals normal in all; internasals rather irregular, usually in one to three pairs; subnasal absent on both sides in three, on one side in two; first canthal separated from lorilabials on both sides in seven, on one side in three; preocular divided on both sides in four, on one side in five; one loreal in all; three postrostrals in one, four in others; lorilabials reduced to one row below subocular by a scale in contact

with both subocular and supralabials on one side in 11, on both sides in four; outer row of labiomentals contacts mental in one.

Dorsal scales 28 to 36, average 32.3 (50 counts: 28, one; 29, five; 30, one; 31, seven; 32, ten; 33, sixteen; 34, five; 35, four; 36, one); ventral scales 36 to 44, average 40.6 (49 counts: 36, two; 37, three; 38, five; 39, six; 40, four; 41, ten; 42, nine; 43, six; 44, four); scales around body 29 to 37, average 33.6 (50 counts: 29, one; 30, three; 31, five; 32, six; 33, four; 34, twelve; 35, eleven; 36, seven; 37, one). Femoral pores 10 to 15, average 13.1 (99 counts: 10, three; 11, ten; 12, eighteen; 13, twenty-five; 14, twenty-eight; 15, fifteen).

Comparisons.—The selection of key characters to separate *S. o. orcutti* and *S. m. magister* is difficult despite the numerous minor differences between the two. There seems to be no single character which serves infallibly to separate them. *S. o. orcutti* in Lower California differs from *m. rufidorsum* and *m. monserratensis* in three characters. These forms usually have six or more supraoculars, femoral pores usually sixteen or more, and labiomental scales in contact with mental.

Differences between *m. magister* and California *o. orcutti* are: labiomental scales in contact with mental in *m. magister*, separated in *o. orcutti* (with rare exceptions in both); median dorsal scales with a relatively deep notch on either side of median mucrone in *o. orcutti*, not in *m. magister;* auricular lobules pointed in *m. magister*, the median ones largest, while in *o. orcutti* the auricular lobules tend to be rounded or notched and not so narrow, and the median ones are not distinctly larger than the upper; the shoulder patch is distinct in *m. magister*, indistinct or absent in *o. orcutti;* the dorsal scales in males of *o. orcutti* have light longitudinal streaks, not in *m. magister;* the entire ventral surfaces are dark blue in adult males of *o. orcutti*, not in *m. magister*.

Specimens from Lower California frequently differ from the California specimens by having the lateral belly patches separate in males, the middle of the throat blue, the chest white, the limbs white except on the anterior surface of thigh, labia and anterior part of gular region faintly barred; sides of head and neck not spotted. The dorsal scales and scales around the body average fewer; the femoral pores are slightly less numerous; there are more frequently two complete rows of lorilabials below subocular.

Habits and habitat.—Van Denburgh (1922, pp. 355–356) states: "This lizard of the rocks is common near San Jacinto, but is very

timid, rarely permitting the collector to approach near enough to use fine shot with deadly effect. In the cool of the morning and late in the afternoon it may be seen upon the highest point of some rounded boulder, but during the warmer hours it avoids the direct rays of the sun, and must be sought on the shady sides of the granite, into whose crevices it quickly disappears when approached too closely. Miss Atsatt [1913, p. 38] writes: 'The grotesque large black males with their bulldog-like pose, the gaudily colored males of medium size, the paler cross-barred females and juveniles are inseparably associated with the foothills and lower areas of San Jacinto. Their wildness or shyness seems to vary with localities. Generally in the late afternoon the males are very bold and will calmly await approach within a few feet.' "

Linsdale (1932, p. 367) states: "Twenty-two of the thirty specimens of this species were obtained from rocks. They were either perched on the tops or clinging to the sides of the boulders. Most of the places were at the margins of meadows, close to streams, or on canyon walls. Other places of capture were as follows: on willow limb at edge of swampy ground; in mouse trap under a 'tuna cactus'; on rocky ledge under a shrub; on the ground in an old corral; picked up by hand in early morning in a trail."

Klauber (1926, p. 116) states that specimens are found at times under flakes attached to boulders.

Locality records.—CALIFORNIA.—SAN BERNARDINO CO.: (LAM 675; AMNH 20645–6); (?) San Bernardino Mts. (LSJU 5574–81); Reche Canyon near Colton (MVZ 68–74, 6280); Waterman Canyon, San Bernardino Mts. (Van Denburgh, 1922). RIVERSIDE CO.: (USNM 54794–805); Cahuilla Valley (LSJU 861–7, 869–77, 879–94, 896–7); Riverside (FMNH 668, 704); 4 mi. SE of Riverside (UMMZ 72655; CAS 47815–30; MCZ 15579); 5 mi. S of Riverside (SDSNH 12310–3); Palm Springs (UMMZ 70787; CAS 35376–9; MVZ 7047–9); Tahquitz Canyon (UCLA 285, 303); San Jacinto Mts. (UCLA 446; USNM 44843); San Jacinto (LSJU 804–12, 815, 817, 821–39, 840–60, 595, 898, 5935–47; USNM 21165); Andreas Canyon (CAS 43204–5; LAM 295–6; USNM 69754–6); Keen Camp (CAS 43063–6); Fuller's Mill, 5,900 ft. (MVZ 288); Schain's Ranch, 4,800 ft. to 5,100 ft. (MVZ 289, 324); Hemet Lake, 4,400 ft. (MVZ 508); Poppet Flat, 4,100 ft. (MVZ 325); Kenworthy, 4,500 ft. (MVZ 566–9); Kenworthy Valley (LMK 20696); Palm Canyon, 3,000 ft. (MVZ 250; LAM 391–3); Pinyon Flat (UCLA 479); Gavilan (LSJU 5500–1, 5576, 5481, 5468, 5493); Perris Valley (LSJU 5601–14); Perris (CAS

57783; MCZ 34104); 2½ mi. SW of Perris (CAS 57782); 7 mi. SW of Perris (CAS 64642); Temescal (LSJU 3299); Temescal Mts. (Van Denburgh, 1922); 5 mi. NE of Elsinore (CAS 57786–93); Elsinore (SDSNH 12314–5); 2 mi. S of Elsinore (USNM 87029–30); Hemet (CM 6286–7); 4 mi. W of Hemet (CAS 57758–63); 6 mi. W of Hemet (CAS 57778); 8 mi. W of Hemet (CAS 57779); Hemet Valley (CAS 20946); 3 mi. E of Hemet (LAM 797[2]); Hall Grade near Cabezon (MVZ 9, 127, 129, 171); Cabezon (MVZ 8, 10–11, 128, 130, 208, 6143–4); Banning (MVZ 12, 113–5, 165, 189; USNM 45038–9, 75139); Snow Creek, 1,500 ft. to 2,000 ft., near Whitewater (MVZ 80–83, 160–4, 6145–9, 6151; UCLA 598–9); Whitewater, 1,816 ft. (MVZ 6150); Carrizo Creek, 3,000 ft. (MVZ 251, 489); Dos Palmas Spring (MVZ 570); Beaumont, 2,500 ft. (MVZ 6153); Idyllwild, 6,000 ft. (MVZ 6152); Moreno (LMK 2793; SDSNH 11935); Temecula (LMK 7504); Winchester (LMK 7505); Auld (LMK 7506–7); Asbestos Spring (LMK 20697); Culp Valley (SDSNH 14048–52); Box Spring (SDSNH 11209); Corona (LAM 306); Mockingbird Canyon (LAM 42); Mt. Rubidon (USNM 68749); Murray Canyon (Van Denburgh, 1922); Lamb Canyon (Van Denburgh, 1922). SAN DIEGO CO.: (LSJU 900–6, 908–11, 913–7; USNM 21918–30, 58693); Campo (UMMZ 57500; CAS 40310–3, 58162–8; AMNH 20479); between Campo and coast (LSJU 922); La Puerta Valley (MVZ 9237); La Puerta (SDSNH 11201, 11210–2, 11511); Jacumba (LMK 491, 512, 2664; USNM 53680–1); 2–3 mi. E of Jacumba (UMMZ 69890; LMK 1293); San Diego (FMNH 666; ANSP 12463); Boulder Park (UMMZ 71150); Mountain Spring (UCLA 43; SDSNH 14043); Strawberry Valley (LSJU 918–20); Clogstone Valley (LSJU 921); Chihuahua Mts. (LSJU 5719–21, 5729, 5736); Dulzura (CAS 64328; LMK 609, 24977); 5 mi. S of Hodges Lake (CAS 58145–7); La Posta (CAS 64520); San Felipe Creek (CAS 62788–92); Sentenac Canyon (CAS 64545; LMK 523, 24978–9; MCZ 20519); Viejas (CAS 64506); Wynola (CAS 64392); Escondido (MVZ 836–7); 7 mi. S of Escondido (AMNH 36843); Pine Mt. (MVZ 838–42); Japatul (LMK 182); Descanso (LMK 187); Clover Flat (LMK 617); Ramona (LMK 710; SDSNH 15883, 16820); between Ramona and Ballena (LMK 1017); between Pala and Bonsall (LMK 1769); El Capitan (LMK 21222–30); Hipass (LMK 24976–7); Jamul (SDSNH 14047, 16503); Montezuma Valley (SDSNH 14169, 14044); Morena Dam (SDSNH 11880–1); Borego Palm Canyon (SDSNH 11943); Poway (SDSNH 13325); Foster (SDSNH 14045); Milquatay Valley (USNM 16328–36); Witch Creek, Santa Isabel (USNM 20214–29, 20345–9, 20386–

90); Oak Grove, Henshaw Dam, Viejas Grade (Van Denburgh, 1922).[1]

Lower California.—Agua de las Fresas (FMNH 1143); Angeles Bay (Van Denburgh, 1922); Arroyo Calentura (LMK 6102); Cañon Esperanza (FMNH 1067, 1058[3]); Carmen Island (CAS 51815–32, 51924–30; LMK 4043–4); Cataviña (MVZ 13577–86); 10 mi. N of Cataviña (SDSNH 15513); Comondú (MVZ 13587–8, 13591–2); Coronados Island, near Carmen (CAS 51757–62); El Cajón Cañón (MVZ 19601–8); 2 mi. E of Ensenada (CAS 57571); between Ensenada and San Rafael Valley (LSJU 705); Ildefonso Island (CAS 51718–28; LMK 4045–6, 6843); La Grulla (MVZ 9748); Laguna Hansen (MVZ 10482–3; LMK 20306–7, 23109); La Joya, San Pedro Martir Mts. (CAS 56886–95); 2 mi. S of La Joya (CAS 57337, 57619–20); Las Encinas (Van Denburgh, 1922); Matomi (FMNH 1059[3]); Nochoguero Valley (Van Denburgh, 1922); Ojos Negros (USNM 37675–6); Palo Gacho (LMK 10369); Parral (FMNH 1060[3]); Pt. San Antonito, San Nicolas Bay (CAS 53600); Rosarito (FMNH 1554); San Antonio (FMNH 1061[5]; LMK 8823–9); San Antonio Ranch (MVZ 9741; USNM 37665); San Antonio de Sarravia (LMK 5121–3); San Francisco Island (CAS 52704–6; LMK 4042); San Ignacio (UMMZ 76482–3[3]; MVZ 10653–4, 10656, 13599, 13597; LMK 4053–4); San José, San Pedro Martir Mts. (CAS 57396–412, 65778–80; LMK 4691–4, 5124–5); San Marcos Island (CAS 51593–6); San Pedro Martir Mts. (LSJU 700–1; USNM 23716–7); San Pedro (LMK 10371); San Rafael Valley (LSJU 704); San Salado River Canyon (FMNH 1063[2]); Santa Rosalia (Mocquard, 1899); San Telmo River (LMK 4041); 2 mi. N of San Vicente Ranch (CAS 57600); San Xavier (Van Denburgh, 1922); Socorro Mine (LMK 10526); Tortuga Island (CAS 51356–459; LMK 4047–9, 6844–5); Trinidad (FMNH 1064); Valladares (MVZ 9733–4); Valle Trinidad (SDSNH 16865–8); Wasson's Ranch, San Rafael Valley (LSJU 702–3); Zacatosa (LMK 10370).

Sceloporus orcutti licki Van Denburgh.

Sceloporus licki Van Denburgh, Proc. Calif. Acad. Sci., (2), **5**, pp. 79, 110–114, pl. 10, 1895; Boulenger, Proc. Zool. Soc. Lond., **1897**, pp. 500–501, 1897; idem, **1898**, p. 915, 1898; Mocquard, Nouv. Arch. Mus. Hist. Nat. Paris, (4), **1**, p. 313, 1899; Cope, Ann. Rept. U. S. Nat. Mus., **1898**, p. 363, 1900; Stejneger and Barbour, Check List N. Amer. Amph. Rept., p. 54, 1917; Nelson, Mem. Nat. Acad. Sci., **16**, pp. 114, 115, 1922; Schmidt, Bull. Amer. Mus. Nat. Hist., **46**, p. 663, 1922; Van Denburgh, Occ. Papers Calif. Acad.

[1] McLain (1899a) reports *o. orcutti* from White River, Tulare County, a record undoubtedly incorrect.

Sci., **10**, pp. 356–358, 1922; Stejneger and Barbour, Check List N. Amer. Amph. Rept., 2nd ed., p. 56, 1923; Linsdale, Univ. Calif. Publ., Zool., **38**, p. 367, 1932; Stejneger and Barbour, Check List N. Amer. Amph. Rept., 3rd ed., p. 62, 1933; Ditmars, Rept. N. Amer., p. 59, 1936.

Type locality.—Sierra San Lazaro, Lower California. Neotype[1] LSJU 2987a (one of two paratypes), collected by Eisen and Vaslit.

Distribution.—Cape region of Lower California, including Isla Espiritu Santo and Isla Partida (fig. 12).

Diagnosis.—A relatively small species of the *spinosus* group, maximum snout-vent measurement 94 mm.; dorsal scales 32 to 40, average 36; ventral scales 35 to 52, average 42.5; scales around body 31 to 42, average 36; femoral pores 13 to 19, average 15.8; five supraoculars, the two posterior in contact with median head scales; first canthal in contact with lorilabials; gular region barred; a black shoulder patch, with a light posterior border; outer row of labiomentals separated from mental; lorilabials usually reduced below subocular by one or more scales in contact with both subocular and supralabials.

Description.[2]—Dorsal head scales smooth, pitted; two parietals, the posterior narrow, transverse, the anterior over twice as large, subtriangular; interparietal pentagonal, slightly more than twice size of anterior parietal; frontoparietal single, twice as long as broad; frontal in contact with interparietal; frontal normally divided; five supraoculars, the fourth and fifth entirely in contact with median head scales; row of scales between supraoculars and superciliaries terminating at suture between third and fourth supraoculars; one complete and another incomplete row of small scales between all supraoculars (except first) and superciliaries; six superciliaries, five visible from above; prefrontals in contact medially; frontonasals normal; two pairs of internasals; four postrostrals, separating nasals and internasals from rostral; subnasal present on one side; two canthals, the first in contact with lorilabials; one loreal; preocular entire; lorilabials reduced to one row below subocular by a scale in contact with both subocular and infralabials; two postoculars; two complete rows of lorilabials in labial region; four or five supralabials and five or five and one-half infralabials to a point below middle of eye.

[1] The type and all of the paratype series in the California Academy of Science were destroyed by the fire of 1906. Two paratypes are preserved in Stanford University.

[2] Based on UMMZ 56044, male, San Bartolo, Lower California.

Mental pentagonal, with a labial border slightly more than half that of rostral; four or five pairs of postmentals, the scales of the anterior pair in contact medially, the others separated; outer row of labiomentals narrowly separated from mental by partial contact of first infralabial and first postmental; all gular scales except those in extreme anterior part, just behind the postmentals, with a single apical notch; median and posterior gular scales somewhat smaller than lateral gular scales.

Auricular lobules six, the median scales the largest, extending across ear; lobules pointed, smooth, larger than preceding scales; temporal scales weakly keeled, weakly mucronate and denticulate, the anterior scales smaller than posterior scales, the largest smaller than median scales between ear and lateral nuchal pocket; scales in latter region strongly keeled, strongly mucronate, strongly denticulate, subequal in size to scales between arm and nuchal pocket; lower scales in latter region very weakly keeled, weakly mucronate, weakly denticulate, directed posteriorly; upper scales in this region more strongly keeled and mucronate, the keels directed upward and caudad.

Dorsal scales keeled, strongly mucronate, denticulate, in parallel rows; lateral scales similar to dorsal scales, more strongly denticulate, about two-thirds size of dorsal scales; ventral scales notched, smooth, those on chest somewhat larger than those on abdomen; preanal scales notched, subequal in size to abdominal scales.

Dorsal scales of foreleg strongly keeled, strongly mucronate, denticulate, subequal in size, about one-third size of dorsal body scales; ventral scales of lower foreleg about three-fifths size of dorsals of same member, the posteroventral scales keeled, the anterior and anteroventral scales smooth, notched; scales in axilla granular; ventral scales of upper foreleg smooth, notched, about two-thirds size of ventral scales of lower foreleg; lamellar formula for fingers 10–14–18–19–14 (9–13–17–18–13).

Dorsal scales of hind leg keeled, strongly mucronate, denticulate, those on shank somewhat larger than those on thigh and about two-thirds size of dorsals on body; scales on anterior and ventral surfaces of thigh smooth, notched, becoming smaller toward femoral pore series; scales on posterior surface of thigh keeled, mucronate, denticulate, largest medially, the largest scales subequal in size to preanal scales; ventral scales of shank smooth, notched, subequal in size to dorsal scales of same member; lamellar formula for toes 10–14–18–23–16 (10–14–18–23–16).

Dorsal caudal scales somewhat larger than dorsals on body, keeled, strongly mucronate, denticulate; subcaudals smooth, notched; enlarged postanals present in males; no postfemoral dermal pocket.

Color.—Adult males are dark reddish brown above; a broad median area on the back is immaculate; most of the scales on the sides of the body with one or more indefinitely outlined pale blue spots; limbs with fairly distinct alternating dark and light bands; distal part of tail faintly banded; labia very distinctly barred, the most conspicuous dark band passing through middle of eye; a black shoulder spot, bordered posteriorly by a light line extending across anterior margin of arm insertion; a light pineal spot; sometimes a light bar across prefrontals and a light median spot on each parietal and frontoparietal.

Ventral surfaces of arms, and chest near arm insertion, white; gular fold region and anterior part of chest black, the color continuous with the black shoulder patch; most of throat black or dark blue, sometimes with a lighter blue central area; chin and part of infralabial region white; lower labia barred, the bars sometimes visible in the central part of the gular region; a broad black streak down middle of abdomen, confluent over chest with black gular fold area; abdomen lateral to this median streak dark blue, becoming lavender toward sides of body, some of the scales frequently with pale blue centers; interfemoral region, anterior part of preanal region, groin, and most of the ventral surfaces of the thighs dark blue or black; ventral surfaces of tail and shank white or cream color.

Young males are similar, but have a dorsolateral light line extending from the posterior corner of the eye to the base of the tail, becoming quite indistinct posteriorly; below this line on the sides of the body is a brown band, narrow anteriorly, extending from the lower posterior margin of the eye to the groin; this lateral brown stripe merges insensibly on the sides of the body with the color of the ventral surface; the light lateral stripe becomes indistinct with increase in size; in the smallest specimens there is a narrow dark line above the dorsolateral light line, and another down the middle of the back; these three dark stripes are separated from each other by two lighter stripes of subequal width; all these stripes indistinct posteriorly; sometimes the three dark dorsal stripes are broken into irregular series of small spots. The black shoulder patch is distinct in the young. The ventral surfaces are colored much as in the adult males, except much less intensely; the youngest have the abdomen immaculate; the groin and the dark medial border of the lateral

abdominal patches are the first to become differentiated with increasing age; the throat is blue-gray in all, with usually rather narrow, convergent white bands.

Females are similar to young males in dorsal coloration. The dorsolateral light stripe is perhaps more distinct. The throat is barred.

Variation.—The variation in cephalic scutellation of 40 specimens is as follows: parietals two in all; frontoparietals divided on one side in two; frontal touches interparietal in all; anterior section of frontal longitudinally divided in one; five superciliaries in one; supraoculars five to seven (5, fifty-seven; 6, twenty-two; 7, one); prefrontals in contact in all; one pair of internasals in 37, two pairs in three; subnasal absent on both sides in 22, on one side in nine; first canthal in contact with lorilabials in 39; preocular divided on one side in three, on both sides in 14; three postrostrals in three, four in others; two complete rows of lorilabials below subocular on one side in two, on both sides in four.

Dorsal scales 32 to 40, average 36 (34 counts: 32, two; 33, three; 34, four; 35, six; 36, eight; 37, eight; 39, two; 40, one); ventral scales 35 to 52, average 42.5 (40 counts: 35, one; 37, one; 38, two; 39, five; 40, six; 41, three; 42, five; 43, four; 44, two; 45, two; 46, two; 47, two; 49, three; 50, one; 52, one); scales around body 31 to 42, average 36 (40 counts: 31, one; 32, one; 33, three; 34, five; 35, seven; 36, six; 37, eight; 38, four; 39, two; 40, two; 42, one). Femoral pores 13 to 19, average 15.8 (78 counts: 13, two; 14, nine; 15, twenty-two; 16, twenty-four; 17, sixteen; 18, four; 19, one).

Comparisons.—*Sceloporus o. licki* differs from *o. orcutti*, its closest relative, in smaller maximum size; in average body scale counts; in average number of femoral pores; in having the lorilabial scale rows reduced below subocular; in having a distinct, black shoulder patch, with a light posterior border in both sexes; in the absence of a light spot in the center of the dorsal scales; by the presence, in females and young males, of a dorsolateral light line, rather distinct anteriorly, indistinct posteriorly; in the absence of a barred pattern in females.

So far as known at present, the ranges of *o. licki* and *o. orcutti* are not contiguous, although they closely approach each other (about 30 miles). It appears quite likely that future collecting will demonstrate complete intergradation in the small area from which no specimens are known at present. In the absence of definite characters separating the two forms, and because of the probable

intergradation in southern Lower California, the two are here considered subspecies.

Locality records.—LOWER CALIFORNIA.—Agua Caliente (CAS 46790–1; MVZ 11709–11); Ballena Island (CAS 52866–79); Cabo San Lucas (CAS 46800–8; AMNH 5437; MCZ 1); Corral de Piedras (Van Denburgh, 1922); El Sauz (MVZ 11702–8); Espiritu Santo Island (LMK 4050–2, 7252–3; AMNH 5485–6; USNM 37670); Guamuchil Rancho (CAS 46809); Isla Partida (CAS 52782–812, 52829–30; LMK 6850–6, 7254–5; FMNH 18413); La Paz (CAS 46775; USNM 53392); Miraflores (AMNH 5564, 5702; USNM 64472; USNM 23749); San Antonio (CAS 46830); San Bartolo (CAS 46780–7; UMMZ 56044); San Bernardo Mt. (AMNH 5487); Sierra El Taste (Van Denburgh, 1922); Sierra San Lazaro (LSJU 2987–8); Todos Santos (CAS 46810–2, 46815–24; MVZ 11701; AMNH 20505); Triunfo (CAS 46779, 46825–8).

Sceloporus magister magister Hallowell.

Sceloporus clarkii Baird and Girard, Proc. Acad. Nat. Sci. Phila., **6**, p. 127, 1852 (part); Yarrow & Henshaw, in Wheeler, Ann. Rept. Geog. Surv. West 100th Mer., **1878**, p. 223, 1878 (part); Stejneger, N. Amer. Fauna, **3**, pp. 110–111, 1890 (part); Cope, Amer. Nat., **30**, p. 1014, 1896 (part); idem, Ann. Rept. U. S. Nat. Mus., **1898**, pp. 358–363, 1900 (part); Stone and Rehn, Proc. Acad. Nat. Sci. Phila., **55**, pp. 30, 31, 1903 (part); Bailey, N. Amer. Fauna, **25**, p. 42, 1905; Mearns, Bull. U. S. Nat. Mus., **56**, pt. 1, pp. 104, 107, 110, 123, 126, 132, 1907 (part ?); Ditmars, Rept. Book, pp. 128, 131–133, 1907 (part); idem, Rept. World, p. 147, 1910 (part); idem, Rept. World, revised ed., p. 147, 1922 (part); Englehardt, Copeia, **1917**, p. 5, 1917; Burt, Trans. Kans. Acad. Sci., **38**, pp. 275, 299, 305, 1936 (part).

Sceloporus magister Hallowell, Proc. Acad. Nat. Sci. Phila., **7**, p. 93, 1854; Duméril, Arch. Mus. Hist. Nat. Paris, **8**, p. 547, 1856; Hallowell, U. S. Pacif. R. R. Explor. Surv., **10**, Lieut. Williamson's Rept., p. 5, 1859; Heerman, U. S. Pacif. R. R. Explor. Surv., **10**, Lieut. Williamson's Rept., p. 24, 1859; Troschel, Arch. Naturg., **26**, pt. 2, p. 272, 1860; Müller, Reisen Ver. Staaten, Canada, Mex., **3**, p. 602, 1865; Cooper, Proc. Calif. Acad. Sci., **4**, p. 66, 1870; idem, Amer. Nat., **3**, p. 478, 1870; Dugès, Naturaleza, **4**, p. 30, 1877; Stejneger, N. Amer. Fauna, **7**, pp. 160, 178–183, pl. 1, figs. 2 *a–c*, 1893; Van Denburgh, Proc. Calif. Acad. Sci., (2), **5**, pp. 82, 113, 1895; Cockerell, Amer. Nat., **30**, p. 326, 1896; Van Denburgh, Proc. Calif. Acad. Sci., (2), **6**, pp. 340, 341, 1896; idem, Occ. Papers Calif. Acad. Sci., **5**, pp. 13, 14, 20, 74, 83, 84–86, 1897; Herrick, Terry and Herrick, Bull. Sci. Lab. Denison Univ., **11**, pp. 125–126, pl. 16, figs. 9–11, 1899; McLain, Collec. Rept. Western Coast U. S., p. 8, 1899 (part); Stejneger, Proc. U. S. Nat. Mus., **25**, p. 150, 1902; Meek, Field Mus. Nat. Hist., Zool. Ser., **7**, p. 10, 1905; Grinnell and Grinnell, Throop Inst. Bull., **35**, pp. 55–56, fig. 21, 1907; Ruthven, Bull. Amer. Mus. Nat. Hist., **23**, pp. 532–536, 537, 538, 1907; Grinnell, Univ. Calif. Publ., Zool., **5**, p. 162, 1908; Stone, Proc. Acad. Nat. Sci. Phila.,

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Sceloporus clarki clarki Coues, U. S. Geog. Surv. W. 100th Mer., **5**, p. 594, 1875 (part); Yarrow, Bull. U. S. Nat. Mus., **24**, p. 63, 1883 (part); idem, Smithson. Misc. Collec., **517**, p. 11, 1883 (part).

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Sceloporus zosteromus Meek, Field Mus. Nat. Hist., Zool. Ser., **7**, p. 11, 1905 (part).

Sceloporus magister magister Linsdale, Univ. Calif. Publ., Zool., **38**, p. 365, 1932; Burt, Amer. Mid. Nat., 14, pp. 237–238, 1933; Klauber, Zool. Soc. San Diego, Bull., **11**, pp. 11–12, 1934; Cowles and Bogert, Herpetologica, **1**, p. 38, 1936; Gloyd, Bull. Chicago Acad. Sci., **5**, pp. 98, 100, 112, 1937; Taylor, Univ. Kans. Sci. Bull., **24**, pp. 477, 484, 1938.

History.—Stejneger's excellent summary of the history of *m. magister* (1893, pp. 178–179) can scarcely be improved upon.

Subsequent to 1893, two monographic studies of the genus have appeared. Boulenger (1897) considered *magister* and *floridanus* conspecific, but conceded them subspecific rank under *spinosus*. *S. clarkii* was also considered a subspecies of *spinosus*. Cope (1900) disagreed with Stejneger and regarded *magister* as a synonym of *clarkii*. Most authors who have dealt with the species since 1900 have recognized the validity of Stejneger's conclusions. The most notable exception is Burt (1935 and 1936), who concludes that the two species are identical. Linsdale (1932) is apparently the first to recognize subspeciation in *magister*.

There is little wonder that difficulty should have arisen in the separation of *magister* and *clarkii*, in view of the nature of the types. The type of *magister* has, thanks to Stejneger's careful study, been correctly defined; however, the three cotypes of *clarkii* include two species: two are specimens of *magister* and the other is typical of the species Stejneger defined as *clarkii*. This latter specimen has a white tag on its leg, and has been designated above as the lectotype of *clarkii*.

Type locality.—Fort Yuma, California.

Distribution.—Southern California, excluding the western slopes, northeastern Lower California, Arizona, New Mexico, southern Nevada and Utah, southwestern Colorado, extreme western Texas, and southward to northern Durango and southern Sonora (fig. 13).

Diagnosis.—A large *Sceloporus* of the *spinosus* group, maximum snout-vent measurement 140 mm.; dorsal scales 26 to 37, average

32.2; ventral scales 40 to 51, average 44.3; scales around body 32 to 39, average 35.5; femoral pores 10 to 16, average 12.8; dorsal scales mucronate, keeled; some of upper lateral scales somewhat larger than median dorsal scales; two parietals on each side; usually five supraoculars on each side, the two posterior usually in contact with median head scales (rarely only the posterior); first canthal usually in contact with lorilabials; outer row of labiomentals in contact

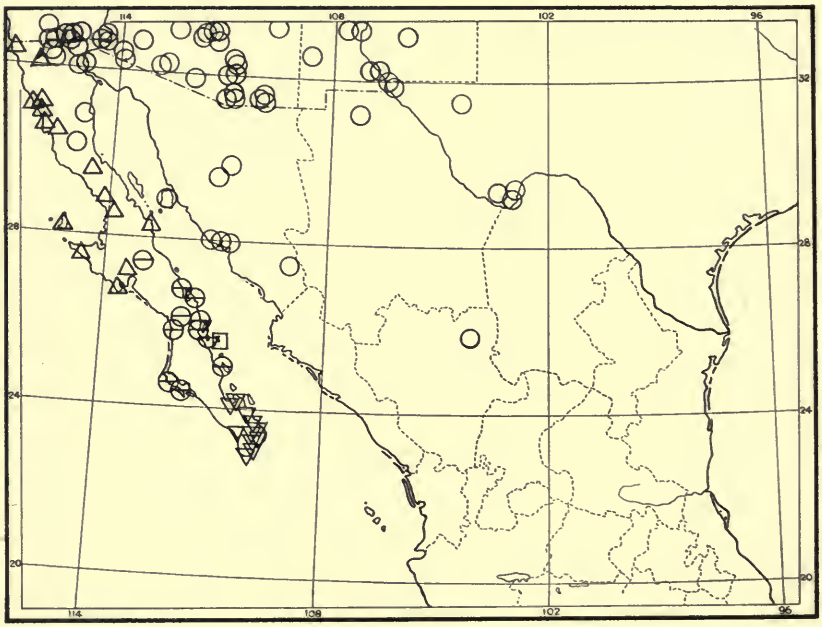

FIG. 13. Distribution of the subspecies of *Sceloporus magister* in Mexico: *S. m. magister*, ○; *S. m. rufidorsum*, △; *S. m. monserratensis*, ⊖; *S. m. lineatulus*, □; and *S. m. zosteromus*, ▽.

with mental; auricular lobules four to eight, elongate, pointed, the median lobules somewhat larger than upper lobules. Lateral scales not dark-sided; females and young with two series of small, dark spots on back; a black or dark gray band on neck (absent, except on shoulder, in adult males); bars, when present on back, distinct and narrow; limbs not distinctly barred; tail usually distinctly banded.

Description.[1]—Head scales smooth, pitted, somewhat convex; interparietal subtriangular; parietals double on either side, the anterior about two-thirds size of interparietal, the posterior narrow,

[1] Based on a female, EHT collection, sandhills north of El Paso, Texas.

smaller; frontoparietals single on each side, subtriangular, narrowed anteriorly, slightly more than half size of either parietal; frontal in contact with interparietal; posterior section of frontal somewhat smaller than anterior section; two prefrontals, broadly in contact medially, about the size of posterior section of frontal; three frontonasals, subequal in size; a small scale wedged between median and lateral frontonasals on each side at their anterior borders; internasals quite irregular; supraoculars five, the anterior smallest and in contact with first superciliary, the others approximately equal in size; a series of small scales intercalated between supraoculars and median head scales, beginning anteriorly at second canthal, terminating posteriorly near the suture between the fourth and fifth supraoculars; a small scale intercalated between fifth supraocular and parietal at their posterolateral margins; a single series of small scales intercalated between supraoculars and superciliaries, extending from posterior edge of first supraocular to posterior edge of last supraocular; five superciliaries visible from above; two canthals, the first touching the lorilabials; subnasal quite small; nasal touching lorilabials immediately in front of subnasal; preocular not divided; a small scale intercalated between preocular and subocular at lower margin; subocular rather long, followed posteriorly by two keeled, well-differentiated postoculars; approximately four supralabials and five infralabials to a point below middle of eye.

Mental broadly shield-shaped, with a labial border slightly more than half that of rostral; outer row of labiomentals in contact anteriorly with mental; about three pairs of well-differentiated postmentals, the scales of the anterior pair in contact with each other medially, the others separated; inner row of labiomentals extending anteriorly to a point below posterior part of second infralabial; gular scales smooth, most with a single apical notch, smaller anteriorly and toward sides of head; scales below ear weakly keeled; scales in gular fold region with not more than two apical notches.

Auricular lobules four–five, the median scales larger than others and extending completely across tympanum; all auricular lobules smooth, acuminate, or rounded, considerably smaller than preceding scales; temporal scales weakly keeled, mucronate toward ear, notched toward eye, smaller than largest scales between ear and lateral nuchal pocket; latter surmounted by weakly keeled, strongly mucronate, denticulate scales; scales between lateral nuchal fold and arm subequal in size to largest temporal scales, very weakly keeled, mucronate, with a single notch on either side of terminal mucrone.

Dorsal scales rather weakly keeled, strongly mucronate, with several lateral mucrones; median lateral scales somewhat smaller than median dorsal scales, of the same character as the latter; ventral abdominal scales with one or two apical notches, one-half to two-thirds size of median dorsal scales; preanal scales one-third or one-fourth smaller than scales in interfemoral and ventral abdominal regions.

Dorsal scales of foreleg much smaller than median dorsals on body (about half), keeled, mucronate, denticulate, somewhat smaller on lower foreleg than on upper foreleg; scales on ventral surface of lower foreleg somewhat smaller than dorsal scales of same member, much larger than ventral scales on upper foreleg, smooth and notched posteriorly, keeled, mucronate and denticulate anteriorly and toward hand; lamellar formula for fingers 8–12–16–15–10 (7–12–16–16–11).

Dorsal scales of hind leg keeled, mucronate, denticulate, subequal in size, or those on shank somewhat larger than those on thigh, the largest but little larger than dorsals on foreleg; ventral scales of shank subequal in size to dorsal scales of same member, smooth, with two apical notches; scales on anterior surface of thigh smooth, acuminate, notched, becoming smaller ventrally toward femoral pore series; scales in a median area on posterior surface of thigh keeled, mucronate, denticulate, somewhat larger than preanal scales, much larger than adjacent scales toward tail, shank, and femoral pores, continuous with larger dorsal scales of thigh; no postfemoral dermal pocket; lamellar formula for toes 8–11–16–20–14 (8–11–16–20–13).

Dorsal scales on rump somewhat reduced in size; dorsal caudal scales nearly as large at base of tail as median dorsal scales on body, much reduced in size distally, strongly keeled, strongly mucronate, strongly denticulate; subcaudals smooth proximally, keeled distally.

Color.—Ruthven (1907, pp. 533–534) describes the color, apparently in life, as follows:

"The color is variable, and the pattern not well defined. The head above is usually mottled with dark brown and yellow or light brown. A narrow brown line extends along the infraorbital scutes from the canthus rostralis, and is continuous on the neck to the shoulder. A similar line parallel to this one extends from the supralabials also to the shoulder. On the nape there are usually indications of narrow V-shaped bands. These are rarely distinct with the exception of the posterior one, which forms a narrow black collar that usually terminates on the side of the neck.

"On either side of the back, about five rows of scales apart and two rows wide, are two longitudinal light bands that are usually some shade of yellow, and may be either quite distinct or obscure. On either side of each light stripe is a row of indefinite dark brown or black spots, the middle two of which may unite to form transverse bands across the back. The scales not included in the stripes are usually yellow and brown, but there are often on the back and sides many blue scales, and these may be numerous enough to form blotches or a solid, broad blue band between the stripes, and to give a bluish cast to the side. This tendency is most conspicuous in male specimens. Again all or most of the scales on the back, sides, and neck may be margined with orange or red, giving an orange appearance to the body. The tail is usually rather distinctly banded above with light brown, and dark brown or black. The scales on the limbs are mostly yellow with brown lateral margins which connect with those of adjacent scales, giving the appearance of narrow longitudinal stripes.

"In old males the pattern above may be nearly obsolete, and the color very dark, the scales being blue black and dark brown. When the skin is shed the color is uniformly yellowish.

"The under surface in females and young specimens is usually light yellow. In the males there is generally a narrow central band of white or yellow but on either side of this are two large blotches of bright metallic blue, occasionally with interspersed scales of bright yellow. The individual scales in the blue area are generally narrowly margined with black. Tail and ventral surface of limbs bluish white. A bright blue spot on the gular region, that may extend over the entire throat, but usually becomes lighter on the anterior part. In nearly all the specimens the black collar is continued across the throat by black edgings to the scales."

Specimens from the northern part of the range more frequently show a development of transverse dark bars on the back, although similarly marked specimens occur in all parts of the range.

Camp (1916) gives the following notes on specimens from the Turtle Mountain region, southeastern California:

"The coloration of the adult males varies a good deal, and this variation is especially noticeable in the vivid ventral colors. One male has the neck band pure black, the throat patch olympic blue of the sheen of porcelain, the darkest belly scales urania blue of a porcelain cast, the scales laterally on the ventral patch variscite green to Blanc's blue. Many of the scales along the sides of the body

are edged with rufous and have brown centers. Scales on the sides of the tail are opaline green. The general color of the upper parts and the top of the head is deep olive buff to buffy brown. . . .

"The ventral patches are in three specimens divided and in one united. There are no indications of dorsal cross bands or spotting in any of the males. The female is marked dorsally with sixteen brown patches, about a scale in width. The lower surface is creamy white lightly tinted on scattered scales with pale greenish, pale orange and, beneath the throat, pale blue. The collar of the female is brown."

Variation.—The following variation in head scutellation is recorded from 113 specimens, unless otherwise stated. Two parietals on each side in all; two frontoparietals on one side in one, on both sides in two; frontal contacts interparietal in 86; frontoparietals contact medially in 17, separated by an azygous scale in eight; frontal entire in two; posterior section of frontal transversely divided in two; anterior section of frontal divided into three scales in one, longitudinally in nine; superciliaries five to seven (162 counts: 5, seventeen; 6, one hundred and forty; 7, five); supraoculars four to seven (226 counts: 4, four; 5, two hundred and three; 6, eighteen; 7, one); only posterior supraocular in contact with median head scales in five counts, two posterior supraoculars in contact in 151 counts, three posterior supraoculars in contact with median head scales in six (81 specimens, 162 counts); prefrontals contact medially in 102, separated by an azygous scale in eight; frontal narrowly in contact with median frontonasal in three; median frontonasal separated from lateral frontonasals on both sides in one, on one side in six, otherwise frontonasals normal; two typical pairs of internasals in 61 (81 counts), three pairs in three, one pair followed by three scales in eight, one pair in three, two pairs followed by three scales in one, irregular in five; nasal contacts rostral in none; subnasal absent (fused with first canthal) on one side in four, on both sides in two (81 specimens); first canthal in contact with lorilabials on one side in six, on neither side in eight, on both sides in 99; preocular divided on one side in eight, on both sides in 17, on neither side in 88; loreals none to two (162 counts: none, three [fused with first canthal]; 1, one hundred and fifty-six; 2, three); four postrostrals in all (81 counts); two complete rows of lorilabials below subocular on one side in five, on both sides in 98, on neither side in 10 (reduced to one row at some point below subocular by one or more scales in contact with both subocular and supralabials); outer row of labio-

mentals contacts mental in all; inner row of labiomentals terminating anteriorly between a point even with anterior part of third infralabial and a point even with posterior part of first infralabial.

Dorsal scales 26 to 37, average 32.2 (90 counts: 26, one; 28, two; 29, six; 30, nine; 31, ten; 32, seventeen; 33, twenty-five; 34, thirteen; 35, three; 36, three; 37, one); ventral scales 40 to 51, average 44.3 (91 counts: 40, two; 42, twelve; 43, nineteen; 44, nineteen; 45, eighteen; 46, fourteen; 47, four; 48, two; 51, one); scales around body 32 to 39, average 35.5 (91 counts: 32, two; 33, three; 34, sixteen; 35, twenty-nine; 36, twenty-one; 37, twelve; 38, six; 39, two). Femoral pores 10 to 16, average 12.8 (173 counts: 10, five; 11, sixteen; 12, fifty-one; 13, fifty-four; 14, forty; 15, six; 16, one).

There is no geographical correlation in the above variational data. Extremes or near-extremes are found in all parts of the range of *magister magister*. Specimens from Nevada and the Grand Canyon region appear different, but I can find no constant differences, either in coloration or scutellation, which might define other races.

Habits and habitat.—Apparently there is some variation in habitat preference in various parts of the range of *m. magister*. Tree yuccas, catclaw thickets, piles of rocks, undercut wash-banks, railroad culverts, ruins of stone or adobe dwellings, and wood-rat nests are frequented. "At the mouth of Beaverdam Creek in northwestern Arizona it was common among cottonwood logs and dead leaves; in Pahranagat Valley it was abundant about the ruins of stone houses and along the faces of cliffs; in the Mohave Desert and other localities it is common on the tree yuccas, where it was often found on the very summits of the highest branches . . . ." (Merriam in Stejneger, 1893.) A specimen collected in Durango was near the top of a telephone pole, and others were seen on other poles.

Ruthven (1907) states that "the few specimens found at Alamogordo were all taken in the creosote bush association on the alluvial slope. They climb about in these bushes much as they do in the large *Opuntias* about Tucson. . . .

"Tucson. The habitat of *S. magister* is well defined in this region. It is quite common on the greasewood plains, but seems to be excluded from the flood-plains of the larger streams (mesquite and willow-poplar associations). Mr. Jouy appears to have been the first to observe that its habitat thus differs from that of *S. clarkii*. Although it occurs in the suaharo-ocotillo association at the foot of the Santa Catalina and Tucson Mountains, it is much less common in these

places. Its principal habitat in this region is thus pre-eminently the creosote bush association of the plains.

"It is very wary and rather difficult to secure as it does not run about on the desert as do the *Crotaphyti* and *Cnemidophori* but resides in the bushes. Individuals were occasionally observed in mesquite or creosote bushes, and more often beneath the Crucifixion thorn, but it evidently prefers the tall branching *Opuntias*, especially the larger ones. Here it may be seen very commonly on the trunks, upon the highest branches or in the nests of wood rats which are constructed of the detached branches of these shrubs on the ground beneath. If the bushes are approached at a good pace the chances are that no lizards will be seen, for when frightened they scramble swiftly down the stems and into a hole, if there is time, or if not flatten themselves out against the trunk of the shrub or among the dead branches on the ground. In such cases they do not give themselves away by the teetering movement so characteristic of many lizards, and their extraordinary resemblance to the trunk or a lobe of an *Opuntia* makes them very difficult to discern. Many times I have seen an individual scuttle down the trunk of one of these cacti but on carefully approaching the bush would be unable to distinguish it, although it would be in full view. . . ."

Richardson (1915) found specimens at Wadsworth, Nevada, in bushes near the river. At Pyramid Lake, Nevada, they were also in bushes near the river, "on tufa cliffs near the lake, or on volcanic rocks in the nearby hills, also along the lake shore, but never very far out on the desert."

Richardson says (1915), that when the specimens are running from bush to bush, the tail is lifted above the level of the body in much the same manner as in *Callisaurus*. Linsdale (1932) reports one found asleep in early morning on the main limb of a small mesquite tree.

The food consists of insects and some vegetation. Merriam (in Stejneger, 1893), Camp (1916), Knowlton (1934), and Knowlton and Thomas (1934) record plant remains in stomachs examined, including fruit, leaves, and flowers. Dr. Edward H. Taylor states that he has observed specimens feeding upon flowers of cacti. Insect food has been recorded by several authors. Ants seem to predominate, and Coleoptera seem to be second in preference. Stinging insects, such as velvet ants and bees, are not avoided. The food naturally varies somewhat with the habitat. Coleoptera, according to Eaton (1935), predominate in stomachs of specimens from localities near Agathla Peak, near Kayenta, Navajo County, Arizona. The locality here

"is rough ground, cut by arroyos and covered with ledges and a scattering of scrubby pine trees, among which the lizards lived. They were usually near the base of a tree. . . ." Families or orders of insects recorded in stomach contents are as follows: Orthoptera, Homoptera, Fulgoridae, Hemiptera, Neuroptera, Chrysomelidae, Buprestidae, Coccinellidae, Tenebrionidae, Carabidae, Dermestidae, Curculionidae, Diptera, Ichneumonidae, Vespidae, Mutillidae, Apidae, Andrenidae, Formicidae, and Lepidoptera (adults and larvae). Spiders have been recorded.

Woodbury (1934) records a *Cnemidophorus t. tessellatus* in the stomach of one specimen. Rüthling (1917) observed specimens in captivity eating *Xantusia vigilis*, and possibly a *Batrachoseps attenuatus*. Rüthling also fed his captives on flies, beetles, moths, isopods, spiders, scorpions, centipedes, and bits of lettuce. The lettuce was tossed into the cage and was grabbed as it fell.

Hibernation was noted by Rüthling (1917) in captive specimens, which hid under pieces of bark that lay under a thick covering of dead leaves when cold weather arrived. They refused to eat but would occasionally emerge on warm winter days.

Rüthling (1917) observed that the colors and markings were more distinct when captive specimens were eating or were excited on a hot day.

Ruthven (1907) records specimens of *magister* in the stomachs of *Crotaphytus wislizenii*, and suggests the road runner as a possible enemy. One specimen in the collection at Brigham Young University was taken from the stomach of a *Masticophis flagellum frenatus*. Nematodes have been reported frequently in the stomachs or intestines, and I have observed a tapeworm in one. Wood (1935) reports on the intestinal protozoa.

Locality records.—TEXAS.—BREWSTER CO.: Glenn Springs (UMMZ 66237–43); Boquillas (USNM 32939–40, 32942); between Chisos Mts. and Terlingua (KU 15070). EL PASO CO.: (UMMZ 53905; MCZ 31690, 7474; FMNH 1653; AMNH 15044; EHT 1; USNM 56860–2); Vinton (MCZ 12850). REEVES CO.: Pecos (ANSP 15743–6). COLORADO.—MONTEZUMA CO.: Southern Ute Indian Reservation, at intersection of Interstate Highway 666 and Mancos River (Barry, 1932). NEW MEXICO.—DOÑA ANA CO.: 15 mi. W of Las Cruces (AMNH 36841); Las Cruces (USNM 22269); Mesilla Valley (USNM 22382). HIDALGO CO.: near Lordsburg (KU 15987). OTERO CO.: Alamogordo (ANSP 1; AMNH 455–8). SIERRA CO.: below Hermosa (MCZ 31681); Elephant Butte Dam (KU 11827–9). SOCORRO

CO.: Fort Craig (USNM 8663); Socorro Mts. (USNM 44592). VALENCIA CO.: Las Lunas (KU 11823–4). UTAH.—EMERY CO.: Green River (UMMZ 61870–84); Lost Creek, San Raphael Desert (UU-437); Straight Canyon, San Raphael Desert (UU 429–31, 433–4, 286–7). GRAND CO.: near Moab (Tanner, 1934). IRON CO.: Cedar City (FMNH 21492). KANE CO.: Kanab and vicinity (UU 11; LMK 24890–1, 24893–915, 21153; KU 1; UMMZ 73271[2], 73272[3], 73273[2], 73274[3], 73275[5], 73277[3], 73280, 73278–9); Hall Cave (BYU 123, 930–7); Willasco Springs Tank, Escalante Desert (BYU 119, 912–6, 115, 901–5); Rock Creek (AMNH 57734, 57736). MILLARD CO.: 8 mi. N of Cove Fort (Knowlton and Thomas, 1934). WASHINGTON CO.: (AMNH 22928–9; MCZ 19152–6); St. George (CAS 54216; MVZ 12245; UU 62–4; BYU 1920 [9], 1929, 2267, 3259[9], 3275, 3279, 3283; LMK 26666–8; USNM 18112–3); 2 mi. S of St. George (LMK 22991–2); 4 mi. W of St. George (LMK 21077); 8 mi. N of Toquerville (UMMZ 60194[3]); between Rockville and Springdale (CAS 47817–28); Rockville (CAS 47829–35; LMK 25598, 25664–5); Springdale (CAS 47811–6); Zion National Park (MVZ 18040–1; UU 221, 631; BYU 3908[7]); near Littlefield, Arizona (UU 510–2); Sham Smelter (UU 414); Beaver Wash (UU 415–6); Bloomington (UU 65; LMK 26665); Leeds (LMK 21076; USNM 44996); Anderson's Junction (LMK 23541); Pintura (LMK 23540); Grapevine Springs, Bellevue (AMNH 22917–9; USNM 36361–2); South Ash Creek, Bellevue (AMNH 22921–2); Diamond Valley, 10 mi. N of St. George (USNM 18114–5); Hurricane (Tanner, 1927); Middleton, Harrisburg, Mt. Carmel, Santa Clara, Washington (Knowlton and Thomas, 1934). WAYNE CO.: Hanksville (UU 436); Cainville (UU 428); Notom, Pleasant Creek (CM 11556). SAN JUAN CO.: (FMNH 25279, 25454, 25527–9; UU 435; BYU 756, 759, 770, 809–10, 812–3, 816, 999; LMK 23593); Bluff City (AMNH 1359–60; UU 432, 717–9); San Juan Bridge Canyon, 3,250 ft. (FMNH 25526); Rainbow Bridge Trail (FMNH 23038[6]); Copper Canyon, 3 mi. NE of Needle Rock (MVZ 21798–9; AMNH 57737, 57739); John's Canyon, 26 mi. NW of Mexican Hat (UU 727); San Juan River, 15 mi. down from Zahn's Camp (AMNH 57735, 57742, 57740); Piute Rapids, San Juan River (AMNH 57732–3, 57743); Aztec Creek (AMNH 57731, 57738, 57741). NEVADA.—CHURCHILL CO.: Sand Spring (MCZ 34102); Hazen (AMNH 34102); 4–6 mi. W of Hazen (MVZ 15955; USNM 87025); Fallon (USNM 48691, 51901); 5 mi. N of Fallon (MVZ 20080–5); 10 mi. W of Fallon (MVZ 14364). CLARK CO.: mouth of Kyle Canyon, Charleston Mts., 4,000 ft. (UCLA 1169–

71); Kaolin, 1,200 ft. (MVZ 20666); Indian Spring, 4,000 ft., Virgin Mts. (MVZ 20074–7); 5 mi. N of Jean (LMK 7611); Piute Valley (LMK 7692); Crescent (SDSNH 15541); Callville (USNM 18104); Las Vegas Valley (USNM 18107); Indian Spring Valley (USNM 18108–9); Bunkerville (USNM 18111); Overton (Cowles and Bogert, 1936). ESMERALDA CO.: Fish Lake, 4,800 ft. (UMMZ 78012; MVZ 10818–20, 10822–4); 2 mi. NW of Cave Springs, 5,700 ft. (MVZ 10821); Columbus (USNM 18133). LINCOLN CO.: Caliente (CAS 37302–17); Meadow Valley, 21 mi. S of Caliente, 3,200 ft. (MVZ 13056); 16 mi. E of Groom Baldy, 4,600 ft. (MVZ 14215); 9 mi. E of Groom Baldy, 5,500 ft. (MVZ 13070); Crystal Spring, Pahranagat Valley (MVZ 14212–4, 14216–9, 14223–9, 14231); 2 mi. E of Crystal Spring (MVZ 14230); Ash Spring, 3,800 ft., Pahranagat Valley (MVZ 14220–2); 1 mi. W of Coyote Spring, 2,500 ft., Pahranagat Valley (MVZ 20078); Pahranagat Mt. and Valley (USNM 18096–102). LYON CO.: Lincoln Highway, 22 mi. W of Fallon (MCZ 20086–8). MINERAL CO.: Cat Creek, 4 mi. W of Hawthorne (MUZ 10858); 3 mi. S of Schurz (MUZ 17096–100). NYE CO.: Rhyolite (CAS 37515–7); Railroad Valley, 11 mi. S of Lock's Ranch, Middle Stormy Spring, 5,000 ft. (MVZ 16217); Ash Meadows, 3.2 mi. WSW of Devil's Hole, 2,150 ft. (MVZ 16080–1; USNM 18105–6); 2 mi. SE of Fairbanks Spring (MVZ 20079); Amargosa River, 3.5 mi. NE of Beatty, 3,400 ft. (MVZ 13055, 13057–69); Pahrump Valley, 5,000 ft. (USNM 18103). WASHOE CO.: Derby and Wadsworth (LSJU 5876–7, 5879, 5889–92); Truckee River, 12 mi. NW of Wadsworth (MVZ 16677); Wadsworth (USNM 50833); Pyramid Lake (KU 11704–7; LSJU 5880–1, 5883–4, 5886–8, 5874, 6282, 6292, 10 without number; CAS 40799–812, 40818–21, 40876, 44152–4; USNM 45201–6, 50808, 50810, 50831–2, 44785); Anaho Island, Pyramid Lake (CAS 40813–7); The Willows, Pyramid Lake (USNM 50834); 4 mi. NW of Quite Indian Agency 3,900 ft. (MVZ 14425–6); Nixon (LSJU 7306[2]). ARIZONA.—COCHISE CO.: Lewis Spring (AMNH 14927); 2 mi. NE of Lowell (MUZ 20536); Tombstone (FMNH 2771). COCONINO CO.: (FMNH 25715, 25739); flats 11 mi. SE of Kanab, Utah (UMMZ 73276[2]); below 8 mi. Gap, 11 mi. SE of Kanab (UMMZ 73281); Cameron (MVZ 17863; LMK 25666); 5 mi. W of Cameron (LMK 25667–8); 11 mi. W of Cameron (UMMZ 72654); Lee's Ferry (USNM 44995, 44998); 5 mi. S of Lee's Ferry (SDSNH 13055); Bright Angel Canyon (LMK 2168–72); Bright Angel Trail, Grand Canyon (MVZ 17578–9); Bright Angel Creek, 2,300 ft. (MVZ 17860–2; SDSNH 13053; USNM 44997); Grand Falls, Little Colorado

River (UCLA 139; LMK 6023); Snake Gulch, Kaibab National Forest (UU 358); Roaring Springs, Grand Canyon (SDSNH 13073–8, 13080–8, 13090–2, 13205–13); Flagstaff (MCZ 6805); Shimmo Creek and Bass Camp, 3,000 ft. Grand Canyon (USNM 59798–9); El Tovar (USNM 56857); Grand Canyon (USNM 15849–50); Supai Springs (USNM 79698); Jacob's Pools (USNM 44999). GILA CO.: 3 mi. NW of Globe (UMMZ 75691); 16 mi. W of Miami (KU 11825; EHT 1); Roosevelt Lake (USNM 54594–6); McMillanville (USNM 54659). GRAHAM CO.: Camp Grant (USNM 24559); east base of Gila Mts. (SDSNH 14057). MARICOPA CO.: (USNM 61388); Phoenix (KU 12444; USNM 58669); Cave Creek, 25 mi. NE of Phoenix (KU 12325; CAS 17287–9, 20718); Winter's Wells, 50 mi. W of Phoenix (CM 1411–2); Gila Bend (KU 11707; SDSNH 14844–6; USNM 61402, 61439); 6 mi. N of Gila Bend (SDSNH 14849, 15480–1); Mesa (UMMZ 75689[3], 75690; LMK 25603); Paradise Valley (CAS 17286); Tempe (LSJU 3172–3); Wickenburg (USNM 73733). MOHAVE CO.: Yucca (AMNH 9245); 10 mi. N of Wolf Hole (MVZ 16391); 25 mi. above dam, Boulder Lake (MVZ 19250); Toroweap Valley, 4,000 ft. (MVZ 16392–5); Beaver Dam Wash, Littlefield (UU 494); Pipe Springs (LMK 24885–9; UU 477; SDSNH 13054); 26 mi. N of Chloride (LMK 10630–1); Chemehuevis Mts. (LAM 445–7); Big Sandy River (USNM 60214, 45149); Hackberry (USNM 60215–7); Topock (USNM 60222–3); mouth of Diamond Creek, 1,500 ft. (USNM 60224–5); Bill Williams River (USNM 45056); 8 mi. NE of Needles (USNM 45147); Ft. Mohave (USNM 42098). NAVAJO CO.: Winslow (FMNH 936[2]); 2 mi. N of Agathla Peak, Kayenta Creek (MVZ 17864–5). PIMA CO.: (AMNH 26739, 27641); Tucson (UMMZ 53946, 65091[3]; CAS 34054, 34057; ANSP 11880; AMNH 489; USNM 16937, 16964–7, 17236–9, 56858); 6 mi. N of Tucson (AMNH 26718); 16 mi. S of Tucson (KU 13141–2); 20 mi. SW of Tucson (KU 13139–40); Steam Pump (AMNH 26692–3, 26695–8, 26703, 26707, 26710, 26712–3, 26717, 26724); Catalina Mts. (CAS 34174–5, 34302–3, 34309–14, 34318–9, 48484–5); Sabino Canyon, Santa Catalina Mts. (KU 6949–50); W end of Catalina Mts. (UMMZ 69887); Kelly Ranch, Catalina Mts. (UMMZ 69881, 69884–6); Ft. Lowell (LSJU 638–9, 642, 803, 2523, 2570); between Ajo and N end of Growler Mts. (UMMZ 69888); 6 mi. NE of Ajo (UMMZ 69858); Sells (UMMZ 68455); Santa Rita Mts. (CAS 48483); Tanque Verde Ranch (SDSNH 16123–5); Roeble's Ranch, near Coyote Springs (ANSP 17471). PINAL CO.: Florence (KU 15544–5); 29 mi. SE of Florence (MVZ 7781); between Florence and Mineral

Mt. (SDSNH 14847–8); Oracle (LMK 22879); Casa Grande (LAM 195–6); Coolidge (LAM 683); 1 mi. N of Willow Spring (AMNH 26708); Superior (MCZ 12476); Price (USNM 54675). SANTA CRUZ CO.: below Sawmill Canyon, Santa Rita Mts. (CAS 63055); Tubac (SDSNH 14813–8, 14820, 14834, 14839–41, 14843). YAVAPAI CO.: Fort Verde (AMNH 1346–7, 1349, 1358; USNM 14815); Congress Junction (LMK 8373; USNM 54664); Yarnell (LMK 8375); Kirkland (USNM 54678); Camp Verde (USNM 59797); Montezuma Well (USNM 59792); Seligman (USNM 45036). YUMA CO.: (USNM 61396); 6 mi. NE of Yuma (UMMZ 69889); Yuma (LSJU 1071–3; CAS 33488–9; ANSP 17483; MCZ 26684–5; USNM 2967, 15952–4, 15957–9, 15965, 37656–8, 46220–2, 47934); between Wellton and Tinajas Altas (UMMZ 71115–6); Tinajas Altas (USNM 21794); Gonzales Well (MVZ 7780); Gila River Valley N of Stoval (SDSNH 14056); Castle Dome (SDSNH 16732); Parker (USNM 16803). CALIFORNIA.—FRESNO CO.: Los Gatos Canyon (LSJU 633); Coalinga (CAS 13206); Kettleman Hills (MVZ 18061); 4 mi. E of Coalinga (MVZ 18062); Stanley, 8 mi. W of Huron (USNM 44808–10). IMPERIAL CO.: Hanlon's Ranch (CAS 33443–5); Yuma Indian Reservation (CAS 33419–21); Holtville (MVZ 4809); Silsbee (MVZ 997); Pilot Knob (MVZ 1848–9); 5 mi. N of Laguna (MVZ 1847); 3 mi. N of Bard (SDSNH 14053–4); Potholes (SDSNH 14055); Palo Verde (LAM 42, 628[2]); Ft. Yuma (USNM 21909–10, 10513); Calexico (USNM 37125); Unlucky Lake, New River (USNM 21911); Laguna Station, Unlucky River (USNM 21912). INYO CO.: Lone Pine (MCZ 10999–11004; FMNH 1237[2]; LSJU 634; USNM 18131–2); Emigrant Canyon (FMNH 1210); Emigrant Pass (LMK 22221–3); Nemo Canyon, Panamint Mts. (CAS 65321–2); Wildrose Canyon, Panamint Mts., 4,000 ft. (MVZ 19249, 6624–6); Willow Creek, Panamint Mts. (Grinnell and Camp, 1917); Panamint Mts. (USNM 18116–9); Bruce Canyon, Argus Mts. (CAS 65483); Shepherd Canyon, Argus Mts. (USNM 18128–30); Searl's Canyon, Argus Range (Stejneger, 1893); (?)Cottonwood Canyon (USNM 9488); Grapevine Mts., 4,000 ft. above Salt Wells, Mesquite Valley (USNM 18110); Independence (MVZ 9460); Mazourka Canyon, Inyo Mts. (MVZ 3686); Little Lake, 3,100 ft. (MVZ 6787–8); Sulphur Springs, 6 mi. N of Shoshone (SDSNH 15866); Stovepipe Wells (SDSNH 15873); between Olancha and Cowan Station (SDSNH 12235–8); Keough Hot Springs (SDSNH 12239). KERN CO.: Mohave (CAS 35467; MVZ 2964); Kern River at Bodfish (MVZ 2951); Weldon, 2,650 ft. (MVZ 2953–63); Onyx, 2,750 ft. (MVZ 2946–50); 5 mi.

E of Onyx (MVZ 2952); Walker Pass (LMK 5732; USNM 18120–2); La Rosa (LMK 8791); 11 mi. N of Randsburg (SDSNH 12240–1); Lonesome Camp (SDSNH 12242). LOS ANGELES CO.: (AMNH 57758–63; AMNH 59118–23); Fairmont (AMNH 9205; UCLA 302 [4]; CAS 48993–7; MVZ 732–3, 833–5; LAM 255–8; USNM 69734–45); Neenach (FMNH 23595–6; LMK 22072–4); Lovejoy Springs (UCLA 136–8; LMK 2831–2; LAM 708[2]); 4 mi. W of Fairmont (UCLA 412); Vasquez Rocks (UCLA 600); 44 mi. E of Palmdale (MVZ 16277–8); Palmdale (LMK 22075–9; LAM 360–2); Antelope Valley (LMK 732–3; CM 4046; USNM 69746–8, 54809–11, 54835); Lovejoy Buttes (LMK 1933–6, 2440–1); Rattlesnake Canyon (LAM 1); Pallett (Grinnell and Camp, 1917). RIVERSIDE CO.: Banning (UMMZ 70788); Gavilan (LSJU 5477–80, 5482–92); San Bernardino Mts. (CAS 43211); Cottonwood Springs (CAS 33343–4, 64676); Mecca (CAS 33333, 45376; MVZ 410, 466–8); 35 mi. E of Mecca (Cowles, 1920); Palm Springs (MVZ 12420–4; SDSNH 12102; USNM 22773); Carrizo Creek, Santa Rosa Mts., 2,000 ft. (MVZ 488, 490); Cabezon, San Jacinto Mts. (MVZ 180, 188); 6 mi. N of Whitewater Junction (LMK 8522); Thousand Palms (LMK 22491, 7797; SDSNH 12084–95); Cahuilla Valley (LSJU 800); Desert Center (LMK 5001–2); Box Canyon (LMK 7796); Andreas Canyon, San Jacinto Mts. (LAM 297). SAN BENITO CO.: 2 mi. SE of Panoche (MVZ 21206–9); Panoche Creek, 1,000 ft, 4 mi. E of Panoche (MVZ 16051, 21354). SAN BERNARDINO CO.: Victorville (UMMZ 56073–4; MCZ 31715; LSJU 5421, 6414; CAS 42827–36; MVZ 819–30, 5377; LAM 374); Apple Valley, 6 mi. E of Victorville (LMK 10635–6); 6 mi. W of Victorville (LMK 7043); 18 mi. SE of Victorville (MVZ 11194); Pilot Knob (FMNH 1246); Hesperia (AMNH 9246; KU 12443; CAS 42872; SDSNH 11381–4, 11207, 11508); Ludlow (CAS 42624); Barstow (CAS 36162–3, 42688–90; LMK 3561–4); Turtle Mts. (CAS 42293–302); Horn Mine, E base of Turtle Mts. (MVZ 15475–9); Cushenbury Springs 4,000 ft. (MVZ 730–1, 832); 3 mi. E of Two Springs (MVZ 18028); Needles (MVZ 1130–1; USNM 44620); W of Topock, Arizona (MVZ 1132); Cajon Pass (LMK 5721–5); Adelanto (LMK 5726–7); Kramer Hills (LMK 5728–9, 5733–4); Thorn (LMK 10637); Deadman Point (LMK 10632–4); Stoddart Well (LMK 20889); Wheaton Spring (LMK 7612); Yucca Station (LMK 7613). SAN DIEGO CO.: (USNM 16522); Jacumba (CAS 40043); 6 mi. E of Jacumba (UMMZ 69859[6]); Boulder Park (KU 12442; LMK 3230–1); San Felipe Creek (CAS 62784–7); Mason Valley (CAS 62872–3); La Puerta (MVZ 1054, 9240–4; LMK 581;

SDSNH 16540, 11311–8, 11333–6, 11415; LAM 76[2]); Warner Pass (MVZ 1032); Yaqui Well (LMK 22330); Collins Valley (SDSNH 11944, 11972); The Narrows (SDSNH 11953); Boulevard (USNM 59361).

LOWER CALIFORNIA.—Matomi (FMNH 1065[2]); Las Palmas Canyon, 200 ft., N side of Laguna, 15 mi. S of California Line (MVZ 10724); El Mayor, 30 ft. Hardy River (MVZ 9544; LMK 10304); 7 mi. E of Cerro Prieto, 30 ft. (MVZ 10755–6); Las Palmitas, S base of Sierra Juarez (SDSNH 17053); Gardner's Laguna (USNM 21913–5); Cook's Wells, Salton River (USNM 21916–7); Volcano Lake (USNM 37659–60); Cocopah Mts., E base (USNM 37663); San Felipe Bay (USNM 37664). SONORA.—Camoa (USNM 46846); Patomotal (USNM 47264); Carbo (LMK 2881–2); Guaymas (LMK 4068); San Carlos Bay, NW of Guaymas (EHT 8336–8); Toban Bay (LMK 4066); Tiburon Is. (CAS 53356–9); Noria (EHT 8341–2); Miramar (EHT 8335, 8339). CHIHUAHUA.—Between El Paso and Janos (USNM 2964). DURANGO.—Near Yermo (EHT 8334).

Sceloporus magister rufidorsum Yarrow.

Sceloporus clarkii zosteromus Lockington, Amer. Nat., **14**, p. 295, 1880.

Sceloporus rufidorsum Yarrow, Proc. U. S. Nat. Mus., **5**, pp. 442–443, 1882 (part); Van Denburgh and Slevin, Proc. Calif. Acad. Sci., (4), **11**, p. 396, 1921; Schmidt, Bull. Amer. Mus. Nat. Hist., **46**, pp. 661, 663, 1922; Van Denburgh, Occ. Papers Calif. Acad. Sci., **10**, pp. 338–341, 1922; Stejneger and Barbour, Check List N. Amer. Amph. Rept., 2nd ed., p. 58, 1923; Slevin, Proc. Calif. Acad. Sci., (4), **15**, p. 204, 1926; Stejneger and Barbour, Check List N. Amer. Amph. Rept., 3rd ed., p. 64, 1933; Ditmars, Rept. N. Amer., p. 59, 1936.

Sceloporus zosteromus Van Denburgh, Proc. Calif. Acad. Sci., (2), **5**, p. 1004, 1896; idem, (3), **4**, pp. 3, 23, 25, 26, 1905 (part); Meek, Field Mus. Nat. Hist., Zool. Ser., **7**, p. 11, 1905 (part); Van Denburgh and Slevin, Proc. Calif. Acad. Sci., (4), **4**, pp. 132, 144, 145, 148, 1914 (part).

(?)*Sceloporus clarkii* Terron, Mem. Soc. Cient. "Antonio Alzate," Mexico, pp. 165, 167, 1921.

Sceloporus magister rufidorsum Linsdale, Univ. Calif. Publ., Zool., **38**, p. 366, 1932 (part); Burt, Amer. Mid. Nat., **14**, p. 237, 1933; Mosauer, Occ. Papers Mus. Zool. Univ. Mich., **329**, pp. 3, 9, 15, 1936.

Sceloporus clarkii rufidorsum Burt, Trans. Kans. Acad. Sci., **38**, p. 275, 1936.

Type locality.—San Quintin Bay, Lower California. Type USNM 11981, collected by Belding.

Distribution.—Northern Lower California exclusive of the northeastern section, southward to include the Vizcaino Desert; Cerros Island (fig. 13).

Diagnosis.—A *Sceloporus* of rather large size, maximum snout-vent measurement about 131 mm.; dorsal scales 27 to 31, average 28.5; ventral scales 37 to 46, average 41.2; scales around body 32 to 37, average 33.9; femoral pores 14 to 21, average 17.5; dorsal scales keeled, strongly mucronate; supraoculars usually six, the last two broadly in contact with median head scales; first canthal in contact with lorilabials; no oblique dark lines on sides of body; belly patches confluent in large males; a narrow, light band down middle of back, bordered on either side by a dark band or a series of dark spots; dark shoulder patch with a light posterior border.

Color.—General dorsal ground color in large males, dark reddish brown; head dark chocolate color; a light, indefinitely outlined, straw yellow median band one and two half scale rows wide extending from shoulder region to base of tail; on either side of this a dark brown, indefinitely outlined band, about two and two half scale rows wide; sides of neck and abdomen, below these dorsal bands, of a dull purple hue, with numerous, scattered, irregularly outlined, white or pale blue spots; these spots usually on the free edges of the scales, one to a scale; the limbs dark reddish brown, the tips of some of the scales white; toes and limbs sometimes with indistinct bands; tail with faint, narrow, alternating light and dark bands.

The entire ventral surface of the abdomen (except a few irregular light areas in middle) a broad area at the posterior part of the throat, the anterior surfaces of the arms, the ventral surfaces of the thighs and a large area on the ventral surfaces of the shank more or less uniform navy blue; the centers of some of the scales on the sides of the abdomen (in some specimens) paler blue; the dark blue color of the abdomen extending dorsad a short distance onto the sides of the body; a small area at the extreme median anterior surface of the chest white or pale blue; a large black area in front of arm, extending into nuchal pocket, continuous with the dark color of the median gular area; shoulder spot bordered posteriorly by a distinct, vertical white band; extreme anterior part of gular area cream color, becoming pale blue near middle of throat, the color blending posteriorly with the dark color of the posterior gular region; narrow, dark blue lines extending forward from the posterior gular area along the edges of the scale rows; ventral surface of tail white or cream color.

Smaller males (90 to 100 mm. snout to vent) are identical with the larger specimens (measuring 115 mm. or more), except for a broken, irregular light area on middle of abdomen, extending from a point even with the axillae to the interfemoral region. Males measur-

ing 60 to 65 mm. show irregular bluish markings on the sides of the abdomen and posterior gular region; the throat is faintly barred; the sides of the body have faint dark brown vertical bands; the areas occupied by the dark bands adjacent to the median light band are replaced by two series, one on each side, of eleven dark brown, more or less square blotches, faint posteriorly on body, distinct anteriorly. There is no evidence of a dorsolateral light stripe or of dark bands along the edges of the lateral scale rows.

The very young are similar to the young males described above. The median dorsal band is visible and narrow in all. In the larger males the dark blotches tend to fuse into bands. The ventral surfaces of females are immaculate, or with irregular blotches on the chest, the throat sometimes faintly barred, with sometimes a bluish spot at the posterior edge of the gular area.

Specimens from Cerros Island are definitely referable to this subspecies. There is no evidence of a lined pattern on the limbs or the sides of the body; the median dorsal stripe is present and narrow. The only difference between these and the northern specimens is the definite development of a darker blue median border on the lateral belly patches in males; the belly patches are also of a lighter hue. This differentiation of a darker median border does not occur in typical *m. rufidorsum* (though a slight indication may be observed in some young specimens from the northern half of the peninsula).

Variation.—The following data have been taken from 51 specimens (unless otherwise stated). Parietals two in all; frontoparietals single on each side in all; frontal touches interparietal in 47, separated by an azygous scale in one, by contact of frontoparietals in three; posterior section of frontal transversely divided in one, anterior section similarly divided in one; superciliaries five or six (6, eighty-eight; 5, fourteen); supraoculars five to seven (5, three; 6, one hundred and forty-six; 7, three); last two supraoculars contact median head scales in all; prefrontals contact in all; median frontonasal separated from lateral frontonasal in one; internasals more or less similar to *m. magister;* subnasal absent on both sides in seven, on one side in one; first canthal separated from lorilabials in one; preocular divided on one side in four, on both sides in two; two loreals on both sides in one, no loreal in one (fused with preocular); lorilabials reduced to one row below subocular by contact of one or more scales with both subocular and supralabials on one side in four, on both sides in two; outer row of labiomentals separated from mental in none of those observed (20).

Dorsal scales 27 to 31, average 28.5 (51 counts: 27, eleven; 28, ten; 29, twenty-two; 30, seven; 31, one); ventral scales 37 to 46, average 41.2 (51 counts: 37, two; 38, four; 39, six; 40, nine; 41, six; 42, nine; 43, six; 44, six; 45, two; 46, one); scales around body 32 to 37, average 33.9 (50 counts: 32, ten; 33, twelve; 34, eleven; 35, ten; 36, five; 37, two). Femoral pores 14 to 21, average 17.5 (167 counts: 14, four; 15, eight; 16, twenty-three; 17, fifty-three; 18, forty-two; 19, twenty-three; 20, ten; 21, four).

Specimens with pore counts of fourteen and fifteen are from Cerros Island (14–15, 15–16, 15–17) and San José (14–14, 14–15). *S. m. magister* in Lower California shows no strong tendency in femoral pore count toward the averages in *m. rufidorsum*. Counts for eight *m. magister* from various localities in Lower California are: 11–12, 12–12(3), 12–13(2), 13–13, 13–14. The specimens with five supraoculars are from El Rosario (5–5) and Cerros Island (5–6). The specimens of *m. magister* with six and seven supraoculars are from Texas (three, 5–6; one, 6–6), Utah (two, 5–6; one, 6–6), Arizona (5–6; two, 6–6), and California (6–7, 6–6). The two latter specimens (from vicinity of Jacumba) are very small and may not be normal. So far as I am aware, intergradation between *m. magister* and *m. rufidorsum* has not been demonstrated; however, as the characters used to separate the two forms overlap somewhat, and because of a very definite similarity in peculiar characters not occurring normally elsewhere in the genus, I have considered the two as subspecies.

Locality records.—Abreojos Point (CAS 55817); Arroyo Calentura (LMK 6103–4); Cataviña (UMMZ 76484); Cerros Island (UMMZ 70790; MCZ 14318–20; FMNH 18409; USNM 11971, 15159, 23885, 24411, 23865, 23867, 23876–8, 23880, 23887, 64473, 71653; AMNH 5475–6; CAS 8842, 8852–7, 56142–50, 59569–76; MVZ 9691–4; LMK 5224–33, 5234–5, 7250–1, 24301–11; SDSNH 15907–17); Colnett (LMK 2883); El Rosario (MVZ 13559–75); Ensenada (UMMZ 57499; USNM 37661–2; AMNH 18342; CAS 8533–7, 8539–40, 6561, 8594–8600, 8622, 8627–31); 4–8 mi. S of Ensenada (CAS 57583; LMK 23696, 23716; SDSNH 11549); Punta Prieta (UCLA 444); Rosarito (FMNH 1066); San Angel (WM 4); San Fernando (USNM 21538); San José (CAS 65777; LMK 4062); 3 mi. W of San José, San Pedro Martir Mts. (CAS 57486); San Pedro Martir foothills (LSJU 693–4); San Quintin (FMNH 1126[4]; CAS 55803–7); San Quintin Bay (USNM 11981, 11979); San Ramón (MVZ 9727, 9885–6); San Raphael (USNM 16853–4); San Telmo (LSJU 695–9;

MVZ 9728–30); Santa Teresa Bay (LMK 4061); Socorro (UMMZ 77073; MVZ 13576); Socorro, 15 mi. S of San Quintin Bay (USNM 21500); Turtle Bay (S of San Bartolome Bay) (CAS 59392; LMK 4060).

Sceloporus magister monserratensis Van Denburgh and Slevin.

Sceloporus zosteromus Mocquard, Nouv. Arch. Mus. Hist. Nat. Paris, (4), **1**, pp. 313–314, 1899 (part); Van Denburgh, Proc. Calif. Acad. Sci., (3), **4**, pp. 3, 23, 25, 26, 1905 (part); Van Denburgh and Slevin, Proc. Calif. Acad. Sci., (4), **4**, pp. 132, 144, 145, 148, 1914 (part); Schmidt, Bull. Amer. Mus. Nat. Hist., **46**, pp. 661–662, 663, 1922 (part); Slevin, Proc. Calif. Acad. Sci., (4), **15**, p. 204, 1926.

Sceloporus monserratensis Van Denburgh and Slevin, Proc. Calif. Acad. Sci., (4), **11**, p. 396, 1921; Schmidt, Bull. Amer. Mus. Nat. Hist., **46**, p. 662, 1922; Van Denburgh, Occ. Papers Calif. Acad. Sci., **10**, pp. 342–344, 1922; Stejneger and Barbour, Check List N. Amer. Amph. Rept., 2nd ed., p. 57, 1923; Barbour and Loveridge, Bull. Mus. Comp. Zool., **69**, p. 335, 1929; Stejneger and Barbour, Check List N. Amer. Amph. Rept., 3rd ed., p. 63, 1933; Ditmars, Rept. N. Amer., p. 59, 1936.

Sceloporus magister rufidorsum Linsdale, Univ. Calif. Publ., Zool., **38**, p. 366, 1932 (part).

Type locality.—Monserrate Island, Gulf of California. Type CAS 50509, collected by Joseph R. Slevin.

Distribution.—Southern edge of the Vizcaino Desert in Lower California, southward to the southern end of the Sierra de la Gigantea; islands adjacent to the coast in the Gulf of California except Santa Catalina (fig. 13).

Diagnosis.—A large *Sceloporus*, maximum snout-vent measurement 108 mm.; dorsal scales 27 to 32, average 29; ventral scales 37 to 49, average 42.6; scales around body 31 to 39, average 34.8; femoral pores 17 to 24, average 20; dorsal scales keeled, strongly mucronate; six or seven supraoculars, the last two (seldom only the last) in contact with median head scales; outer row of labiomentals usually in contact with mental; first canthal in contact with lorilabials. Lateral scale rows (in adult males) with more or less continuous, oblique, dark lines; belly patches not confluent; a narrow, median dorsal, light band, bordered on each side by a series of dark spots or (in adult males) by a dark band; dark shoulder patch with a light posterior border.

Color.—The markings are in general similar to those of *m. rufidorsum*, with the following exceptions: the edges of the scale rows on the sides of the body and, in males, on the sides of the neck, have a dark streak; most of the chest and a continuous, median ventral

abdominal streak are white (males); sides of belly pale lavender, with a distinct dark blue median border extending into groin and, in the largest males, onto the thighs; this border sometimes continuous over chest, and uniting with the black shoulder patches; ventral surfaces of shank immaculate except in largest males; usually in the females, always in the males, the scale rows on the limbs have a median light streak. Most of the young show no lined pattern on the sides of the body; however, all of the adults (except some females) show a distinct lined pattern. The limbs of the young are lined. The females are similar in ventral coloration to those of *m. rufidorsum*, except that there is a stronger development of the male color characteristics: the throat patch is more distinct than in females of *m. rufidorsum*, and the lateral abdominal marks, including the median dark blue border, are more in evidence.

There is a tendency in these toward the development of the lateral dorsal dark bands, resulting from coalescence of the two series of dark spots. The dark spots are in evidence in the young, however, and in most of the females; in the adult or subadult males the spots are replaced completely by bands. In a few adult males the median dorsal light streak is but little in evidence; I believe this may be due to loss of the scales. In all others the median light band is distinct.

Variation.—The following data have been taken from 62 specimens, unless otherwise stated. Two parietals in all; two frontoparietals on both sides in one, on one side in another; frontal touches interparietal in 51, separated by an azygous scale in three, by contact of frontoparietals in eight; posterior or anterior section of frontal divided into two or more scales in seven; seven superciliaries on one side in one, six in others; supraoculars five to seven (5, one; 6, one hundred and seven; 7, sixteen); last supraocular only in contact with median head scales in eight, last two in 54; prefrontals contact medially in 51, separated by an azygous scale in two, by contact of frontal and median frontonasal in nine; internasals more or less as in *m. magister;* subnasal absent on both sides in six, on one side in one; first canthal touches lorilabials in all; preocular divided on both sides in one, entire in others; loreal single in all; two postrostrals in one, five in one, four in 60; lorilabials reduced to one row below subocular by contact of one or more scales with both subocular and supralabials on one side in four, on both sides in three; labiomentals narrowly separated from mental on one side in three, on both sides in eight (32 observed).

Dorsal scales 27 to 32, average 29 (60 counts: 27, seven; 28, seventeen; 29, twelve; 30, sixteen; 31, seven; 32, one); ventral scales 37 to 49, average 42.6 (60 counts: 37, one; 38, two; 39, three; 40, nine; 41, eight; 42, five; 43, eight; 44, six; 45, seven; 46, five; 47, three; 48, one; 49, two); scales around body 31 to 39, average 34.8 (60 counts: 31, two; 32, three; 33, thirteen; 34, fifteen; 35, six; 36, ten; 37, six; 38, four; 39, one). Femoral pores 17 to 24, average 20 (190 counts: 17, seven; 18, twenty-seven; 19, forty; 20, forty-five; 21, forty-one; 22, twenty-one; 23, five; 24, four).

Remarks.—S. magister monserratensis is here considered as the occupant of the middle faunal zone of Lower California, and is not restricted to Monserrate Island. Until recent years but little material has been available from the central faunal zone which accounts for

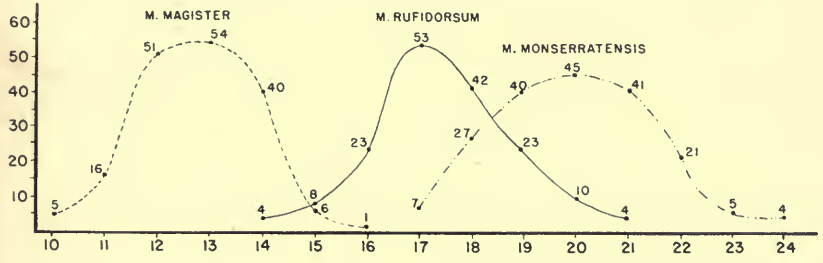

FIG. 14. Variation in number of femoral pores in *Sceloporus m. magister*, *S. m. rufidorsum*, and *S. m. monserratensis*.

the varied treatment in the past of what specimens were available. It appears obvious that the form differs from *m. rufidorsum*, and that the break occurs where I have placed it (southern boundary of Vizcaino Desert). Femoral pore counts as well as coloration bear this out. The Monserrate Island specimens differ from *m. rufidorsum* in exactly the same characters as the specimens from the central mainland region; I can discern no differences between the island and central mainland specimens.

It is true that the essential color differences between *m. rufidorsum* and *m. monserratensis* are evident mostly in adult males; the young and females may not have the color pattern so distinct. There are three major differences in color pattern: sides of body with narrow dark lines; belly patches in males not confluent, with a narrow, dark, medial edge; females with rather distinct ventral markings similar to those in males. In the possession of a narrow, median dorsal light band bordered on either side by a series of dark spots or by a dark band, *m. monserratensis* agrees with *m. rufidorsum*,

but differs from *m. zosteromus*, which has completely lost the two dorsal series of dark spots, or the dark bands (spots visible in very young). *S. m. zosteromus* differs from *m. monserratensis* also in average femoral pore count, though the difference is less than that between *m. monserratensis* and *m. rufidorsum*. *S. m. zosteromus* agrees with *m. monserratensis* in possessing the dark, oblique lines on the sides of the body.

In femoral pore counts, 22.2 per cent of *m. rufidorsum* have 19 or more pores on a side, while 82.1 per cent of *m. monserratensis* have 19 or more pores on a side.

Locality records.—LOWER CALIFORNIA: Coast of Lower California (USNM 14089 [2]); Comondú (FMNH 25846, 25848–9; MVZ 13589–90); between Comondú and Loreto (USNM 67387–91); El Medano (MVZ 13609–10); Loreto (FMNH 25847); Monserrate Island (MCZ 16840; CAS 50509, 52256–78); Mulege (Mulejé) (Mocquard, 1899); Pt. Santa Antonita, San Nicolas Bay (CAS 53623); Puerto Escondido (CAS 53635); San Ignacio (WM 3; UMMZ 76483 (16); MVZ 10650–2, 10655, 10657–8, 13593–6, 13598, 13600–6; LMK 4055–9; USNM 37666–9); San Jorge (MVZ 13607–8); San José Island (CAS 52687–92; MVZ 11726–7; LMK 4063–4, 6848–9); Santa Magdalena Island (CAS 55933–97, 59361–88; MVZ 13611–7; LMK 10251, 10693; USNM 71629–30); Santa Margarita Island (CAS 56086–104; MVZ 13618–22; LMK 4065).

Sceloporus magister lineatulus Dickerson.

Sceloporus lineatulus Dickerson, Bull. Amer. Mus. Nat. Hist., **41**, pp. 467–468, 1919; Van Denburgh and Slevin, Proc. Calif. Acad. Sci., (4), **11**, p. 396, 1921; Nelson, Mem. Nat. Acad. Sci., **16**, pp. 114, 115, 1922; Schmidt, Bull. Amer. Mus. Nat. Hist., **46**, p. 662, 1922; Van Denburgh, Occ. Papers Calif. Acad. Sci., **10**, pp. 345–347, 1922; Stejneger and Barbour, Check List N. Amer. Amph. Rept., 2nd ed., p. 56, 1923; idem, 3rd ed., p. 62, 1933; Ditmars, Rept. N. Amer., p. 59, 1936.

Type locality.—Santa Catalina Island, Gulf of California. Type USNM 64263.

Distribution.—Known only from Santa Catalina Island, Gulf of California (fig. 13).

Diagnosis.—A large *Sceloporus*, maximum snout-vent measurement 115 mm.; dorsal scales strongly mucronate, keeled, 28 to 31 from occiput to base of tail; femoral pores 17 to 20; supraoculars five or six, the last two in contact with median head scales; first canthal in contact with lorilabials; outer row of labiomental scales separated from mental, or in contact; belly patches confluent in

adults; shoulder patch not light-bordered posteriorly; females colored exactly like males below.

Color.—"The color above, in adult males, is yellowish brown, becoming browner on the hind limbs and base of tail. A few of the scales of the back are marked with greenish blue in varying amount. The scales on the base of the tail are not spotted but those on the hind limbs often are marked centrally with yellowish or bluish gray. The scales on the base of the tail usually are edged with yellow. There is no well-developed longitudinal light streak along the middle of the back but this region is lighter than the rest of the body. There is no dorsolateral longitudinal light band, even on the neck. The sides of the body are bluish or grayish with more or less parallel narrow, dark lines running in the direction of the keels of the lateral scales. These lines are formed by from one to three dark brown or blackish lines on each scale. The central area of each lateral scale is bluish or grayish. The top of the head is brownish olive, usually without markings. There is a large, black blotch or collar in front of the shoulder, sometimes indistinctly edged behind and in front with pale blue or greenish yellow. There is a similar but smaller black blotch on the anterior and ventral surfaces of the thigh and of the body. These two black blotches may be connected by a black streak along the belly just external to a median longitudinal stripe of yellowish white, but in most specimens the entire median portion of the belly is black. This black ventral area extends forward onto the chest, where it is more or less tinted with, or replaced by, spots of greenish blue. The central gular region is blackish indigo, while on the chin and anterior gular region the scales are lighter indigo with lighter blue centers which may form parallel longitudinal blue lines separated by darker ones. The upper surfaces of the limbs are yellowish brown or olive, usually with longitudinal dark and light streaks. The tail rarely is faintly crossbarred above with brown.

"Females and young males are similarly colored, and do not have more evident dorsal dark spots or light dorsolateral lines." (Van Denburgh, 1922, pp. 346–347.)

Variation.—The variation in cephalic scutellation of 10 specimens is as follows: parietals two in all; frontoparietals single in all; frontal touches interparietal in all; five superciliaries on one side in three; five supraoculars in seven counts, six in 13; prefrontals in contact in all; one pair of internasals in nine, one and one half pairs in one; subnasal absent on both sides in three, on one side in one; outer row of labiomentals contacts mental in five.

Dorsal scales 28 to 31 (28, one; 29, four; 30, four; 31, one); ventral scales 38 to 42 (38, one; 39, three; 40, two; 41, one; 42, two); scales around body 30 to 33 (30, one; 32, four; 33, five). Femoral pores 17 to 20 (17, two; 18, two; 19, six; 20, ten).

Remarks.—*S. m. lineatulus* is quite similar to *m. monserratensis* and *m. zosteromus;* it differs from the former in not having a narrow median dorsal light streak; it differs from both in lacking a light posterior edge on the black shoulder patches.

Specimens examined.—Santa Catalina Island (MCZ 32429; AMNH 5477; USNM 64263; LMK 6847; CAS 52311–9).

Sceloporus magister zosteromus Cope.

Sceloporus zosteromus Cope, Proc. Acad. Nat. Sci. Phila., **1863**, p. 105, 1863; idem, **1866**, p. 312, 1867; Bocourt, Jour. Zool., Paris, **5**, p. 402, 1876; Garman, Bull. Essex Inst., **16**, p. 17, 1884; Cope, Proc. Amer. Phil. Soc., **22**, pp. 395, 399, 1885; Boulenger, Cat. Liz. Brit. Mus., **2**, pp. 218, 225–226, 1885; Cope, Bull. U. S. Nat. Mus., **32**, p. 37, 1887; idem, Proc. U. S. Nat. Mus., **12**, p. 147, 1889; Stejneger, N. Amer. Fauna, **7**, pp. 178, 181, pl. 1, figs. 3 *a–c*, 1893; Van Denburgh, Proc. Calif. Acad. Sci., (2), **5**, pp. 79, 82, 108–110, 113, 1895; Cope, Amer. Nat., **30**, p. 1013, 1896; Boulenger, Proc. Zool. Soc. Lond., **1898**, p. 915, 1898; Mocquard, Nouv. Arch. Mus. Hist. Nat. Paris, (4), **1**, pp. 313–314, 1899 (part); Cope, Ann. Rept. U. S. Nat. Mus., **1898**, pp. 337, 338, 339, 356–8, fig. 53, 1900; Ditmars, Rept. Book, pp. 128, 133, 1907; Lydekker, in Lydekker [and others], Rept. Amph. Fish., p. 79, 1912; Stejneger and Barbour, Check List N. Amer. Amph., p. 57, 1917; Dickerson, Bull. Amer. Mus. Nat. Hist., **41**, p. 468, 1919; Terron, Mem. Soc. Cient. "Antonio Alzate," Mexico, **39**, 165, 167, 1921; Van Denburgh and Slevin, Proc. Calif. Acad. Sci., (4), **11**, p. 396, 1921; Nelson, Mem. Nat. Acad. Sci., **16**, pp. 114, 115, 1922; Schmidt, Bull. Amer. Mus. Nat. Hist., **46**, pp. 661–662, 663, 1922 (part); Van Denburgh, Occ. Papers Calif. Acad. Sci., **10**, pp. 348–352, 1922; Stejneger and Barbour, Check List N. Amer. Amph. Rept., 2nd ed. p. 59, 1923; idem, Check List N. Amer. Amph. Rept., 3rd ed., p. 65, 1933; Ditmars, Rept. N. Amer., pp. 47, 51–52, 1936.

Sceloporus clarkii zosteromus Cope, Bull. U. S. Nat. Mus., **1**, pp. 49, 93, 1875; Coues, U. S. Geog. Surv. W. 100th Mer., **5**, p. 595, 1875; Yarrow, Bull. U. S. Nat. Mus., **24**, pp. 64, 189, 1883; idem, Smithson. Misc. Coll., **517**, p. 11, 1883; Belding, W. Amer. Sci., **3**, p. 98, 1887; Burt, Trans. Kans. Acad. Sci., **38**, p. 275, 1936.

Sceloporus rufidorsum Yarrow, Proc. U. S. Nat. Mus., **5**, pp. 442–443, 1882 (part); idem, Bull. U. S. Nat. Mus., **24**, p. 64, 1883; idem, Smithson. Misc. Coll., **517**, p. 11, 1883; Garman, Bull. Essex Inst., **16**, p. 18, 1884; Belding, W. Amer. Sci., **3**, p. 96, 1887; idem, p. 98, 1887; Townsend, Proc. U. S. Nat. Mus., **13**, p. 144, 1890.

Sceloporus magister zosteromus Linsdale, Univ. Calif. Publ., Zool., **38**, p. 366, 1932; Burt, Amer. Mid. Nat., **14**, p. 237, 1933.

Type locality.—Cape San Lucas, Lower California. Cotypes USNM 5298 (23), 69472–88.

Distribution.—Cape Region of Lower California (fig. 13).

Diagnosis.—A large *Sceloporus*, maximum snout-vent measurement 97.5 mm.; dorsal scales 26 to 32, average 29.3; ventral scales 36 to 46, average 41.3; scales around body 32 to 39, average 34.4; femoral pores 16 to 22, average 18.6; dorsal scales keeled, strongly mucronate; supraoculars six, rarely seven, the last two (seldom only the last) in contact with median head scales; outer row of labiomentals usually in contact with mental; first canthal in contact with lorilabials; lateral scale rows with oblique, narrow, dark lines; a broad, light band down middle of back, not bordered laterally by a series of darker spots (except in young); shoulder patch with a light, posterior border; belly patches (males) separated, with a dark medial border.

Variation.—The variation in cephalic scutellation is practically identical with that of *m. monserratensis*, and need not be repeated.

Dorsal scales 26 to 32, average 29.3 (83 counts: 26, one; 27, eight; 28, ten; 29, twenty-six; 30, twenty-one; 31, fifteen; 32, two); ventral scales 36 to 46, average 41.3 (24 counts: 36, one; 37, one; 38, one; 39, three; 40, two; 41, three; 42, five; 43, four; 44, three; 46, one); scales around body 32 to 39, average 34.4 (24 counts: 32, five; 33, four; 34, three; 35, six; 36, two; 37, three; 39, one). Femoral pores 16 to 22, average 18.6 (160 counts: 16, eleven; 17, thirty-six; 18, thirty-two; 19, forty; 20, twenty-one; 21, fifteen; 22, five).

The only diagnostic difference between *m. monserratensis* and *m. zosteromus* is in color; in femoral pore counts there is a slight but insignificant difference. In the former, there is a narrow light median dorsal band bordered on either side by a series of dark spots or by a dark band; in *m. zosteromus* the dark spots and bands are missing (except in the very young) and the entire dorsal surface is occupied by a broad light band.

The young of *m. monserratensis* and *m. zosteromus* seem to differ in color. In the latter, the markings on the back and sides are distinct and the black shoulder spot is gray. In *m. monserratensis* the markings are very distinct, especially anteriorly, and the shoulder spots are very black.

In the rather immature males (76 to 88 mm. snout to vent) the dorsal spots are absent, and in their stead are two irregular series, one on each side of the mid-dorsal line, of irregular pale blue spots.

In these the tail has no regular markings; the bases of the caudal scales are brownish, the outer part straw yellow.

The ventral abdominal coloration of adult males is as in *m. monserratensis*, not as in *m. rufidorsum*.

Locality records.—LOWER CALIFORNIA: Agua Caliente (UMMZ 56072; CAS 46745–55, 46788–9; MVZ 11729–32); Buenavista (CAS 46743–4); Cape San Lucas (USNM 5298, 69483–8, 15893, 37672; AMNH 5473; CAS 46768; LMK 2733, 10775–7); El Centenario, near La Paz (USNM 62718); El Triunfo (MVZ 13623–4); El Zacatal (MVZ 2); Eureka (MVZ 11733); San Antonio (4 mi. E of El Triunfo) (CAS 46741–2, 46829); Miraflores (USNM 69473–9, 64466–7; FMNH 25845; AMNH 5489, 5484; CAS 46756–8, 46792); San José del Cabo (USNM 46889–90, 64468–71; FMNH 659; LSJU 2958–9, 2962–4; CAS 46759–67, 46793–9); San José Mission (USNM 69481–2); San Pablo (Van Denburgh, 1895); San Pedro (MCZ 13183–4; CAS 46735–40, 46778); Santa Anita (USNM 37671; MVZ 11728); Santiago (USNM 69480, 69472); Todos Santos (CAS 46769–74, 46813–4; MVZ 11712–25).

THE UNDULATUS GROUP

Thirteen forms are regarded as forming the *undulatus* group; nine are confined to areas north of the Mexican boundary, and only one to Mexico. The southern limit of distribution is central Zacatecas. Only the four forms which enter Mexico are treated in the present paper, and these in abbreviated form since the group has recently been treated in a separate paper (Smith, 1938).

KEY TO FORMS OF THE UNDULATUS GROUP

1.—First canthal in contact with lorilabials.....*woodi*
First canthal not in contact with lorilabials.....2

2.—Scales on posterior surface of thigh abruptly differentiated from dorsal scales of same member, median posterior scales not distinctly larger than adjacent lateral posterior scales.....3
Scales on posterior surface of thigh gradually merging with larger dorsal scales of same member, at least the median posterior scales distinctly larger than the adjacent lateral posterior scales.....6

3.—Labial region, chin and throat crossed by irregular, diagonal, dark lines radiating from the gular region; frontoparietals often in contact with enlarged supraoculars.....*o. becki*
Labial region, chin and throat not crossed by radiating dark and light lines or bands; frontoparietal plate very rarely in contact with enlarged supraoculars.....4

4.—Blue belly patches not confluent with throat patches, and separated from each other by a lighter or darker midventral band.....5
Blue belly patches confluent with throat patches, and not separated from each other by a lighter or darker midventral band; ventral surfaces deep blue throughout.....*o. taylori*

5.—Blue of throat in males in paired lateral patches (blue widest laterally or separated by median white stripe) which may merge medially in older specimens; under parts very light in color or speckled with darker scales. *o. occidentalis*

Blue of throat in males in a central patch, never divided; under parts often gray or black..... *o. biseriatus* (p. 174)

6.—Femoral pore series separated by nine or more scales; gular patches discrete, widely separated..... *cautus* (p. 173)

Femoral pore series separated by eight scales or less; or if nine or more the gular patches large and closely approximated and meeting, the whole throat frequently blue and black.....7

7.—Dorsal scales 37 or less.....8

Dorsal scales 38 or more.....9

8.—Males lacking belly patches..... *u. virgatus* (p. 176)

Males with broad, lateral belly patches..... *u. undulatus*

9.—Dorsal scales 45 or more..... *u. elongatus*

Dorsal scales 44 or less.....10

10.—Males without lateral belly patches; dorsolateral and lateral light stripes very distinct..... *u. virgatus* (p. 176)

Males with lateral belly patches.....11

11.—Males without gular patches; femoral pores 14 or less; dorsolateral light stripes distinct in both sexes..... *u. garmani*

Males with gular patches.....12

12.—Females with lateral belly patches; femoral pores 16 or more (74.7 per cent). *u. tristichus*

Females without lateral belly patches.....13

13.—Dorsolateral light stripes distinct in males; dorsal crossbars reduced in males, confined to areas between dorsolateral light stripes; gular region with two dark patches posteriorly, not extending over entire throat; femoral pores 16 or more (69.7 per cent)..... *u. consobrinus* (p. 175)

Dorsolateral light stripes indistinct in males; dorsal crossbars extending completely across back when visible; gular region almost entirely black in adult males; femoral pores 15 or less (80.7 per cent)..... *u. fasciatus*

Sceloporus cautus Smith.

Sceloporus cautus Smith, Occ. Papers Mus. Zool. Univ. Mich., 387, p. 2, 1938.

Type locality.—Thirty miles north of El Salado (San Luis Potosí), in Coahuila. Type EHT 13027.

Distribution.—Eastern Zacatecas, northwestern San Luis Potosí, and extreme southern Coahuila.

Diagnosis.—A *Sceloporus* of the *undulatus* group, of relatively large size (maximum snout-vent measurement 80 mm.); scales on posterior surface of thigh somewhat smaller than preanal scales; dorsal scales 31 to 39; femoral pores 10 to 14, the two series separated medially by 9 to 12 scales; supraoculars large, entire, separated from median head scales by one complete series of scales, from superciliaries by one complete and one incomplete series of small scales; dorsal scales strongly mucronate; two dark spots on either side of throat posteriorly in both sexes; dorsolateral light stripes present, but broken or faint; back barred in females; males with a series of

dark spots on each side of mid-dorsal line; lateral belly marks blue, dark bordered, widely separated medially.

Variation.—There is surprisingly little variation in cephalic scutellation. In the 11 specimens examined the head scales are similar to those of the type except: five superciliaries in two; one incomplete and two complete rows of small scales between supraoculars and superciliaries in one; six supraoculars in one; fifth supraocular narrowly in contact with median head scales in one; prefrontals separated by an azygous scale in five; internasals irregular in six; preocular entire on both sides in nine, on one side in one; two complete rows of lorilabials below subocular in six. Variation in body scale counts is given in the table accompanying the original description.

Comparisons.—If it is correct to assume that the *undulatus* group is derived from the *spinosus* group, *cautus* may be considered a "missing link" between the two groups. The species is obviously closely related to *spinosus*, but differs from it in characters which associate it with the *undulatus* group.

From *spinosus spinosus*, *cautus* differs in the following characters: blue spots at posterolateral edge of throat (never in *spinosus*, in which the throat is barred); supraoculars five or six (usually four in *spinosus spinosus*); femoral pores 10 to 14 (rarely 11 or 12 in *s. spinosus*); dorsal scales 31 to 39 (rarely more than 30 in *s. spinosus*); dorsal bands more numerous (nine or ten in *cautus*, six or seven in *s. spinosus*).

From *u. undulatus*, which has an average dorsal scale count near that of *cautus*, the latter form differs in the ventral coloration of the male, in the character of the supraocular scales, number of scales between femoral pore series, character of the auricular lobules, and number of dorsal crossbars.

S. occidentalis biseriatus differs in average dorsal scale count, average femoral pore count, character of supraocular scales, and ventral coloration.

Locality records.—COAHUILA: 30 mi. N of El Salado, San Luis Potosí (EHT 13027–8). SAN LUIS POTOSÍ: Charcas (UMMZ 77274); 30 mi. N of Matehuala (EHT 13025). ZACATECAS: 10 mi. S of Majoma (EHT 13050, 13056–61).

Sceloporus occidentalis biseriatus Hallowell.

Sceloporus biseriatus Hallowell, Proc. Acad. Nat. Sci. Phila., **7**, p. 93, 1854.

Sceloporus occidentalis biseriatus Camp, Univ. Calif. Publ., Zool., **17**, p. 65, 1916.

Type locality.—El Paso Creek, Tejon Valley, California.

Distribution.—Southern Idaho, southwest through Nevada and western Utah into California; San Pedro Martir range in Lower California.

Diagnosis.—First canthal not in contact with lorilabials; scales on posterior surface of thigh abruptly differentiated from dorsal scales of same member, the median posterior scales not distinctly larger than adjacent lateral posterior scales; femoral pore series separated medially by nine or more scales; femoral pores 13 to 18; dorsal scales 35 to 44; throat not barred; belly patches in males not confluent with throat patch; a single central throat patch in males.

Locality records.[1]—Lower California records are from Tiajuana, Laguna Hanson, San Antonio, Ensenada, Santo Tomas, Decarte, Valladares, San Pedro Martir Mountain, Trinidad, Santa Rosa, San José, Rosarito Divide, San Isidro Ranch, Nachoguero Valley near United States border, Sauz and San Ramon (Van Denburgh, 1922; Schmidt, 1922; Linsdale, 1932).

Sceloporus undulatus consobrinus Baird and Girard.

Sceloporus consobrinus Baird and Girard, in Marcy and McClellan, Explor. Red R., La., p. 237, pl. 10, figs. 5–12, 1853.

Sceloporus undulatus consobrinus Cope, Ann. Rept. U. S. Nat. Mus., **1898**, p. 377, fig. 60, 1900.

Type locality.—Red River, Beckham County, Oklahoma.

Distribution.—Texas except eastern fourth, southwestern Oklahoma, extreme western and southern fourth of New Mexico, southeastern Arizona in vicinity of San Pedro River, south in Mexico to central Zacatecas, central Chihuahua on the west and central Tamaulipas on the east.

Diagnosis.—First canthal not in contact with lorilabials; scales on posterior surface of thigh gradually merging with larger dorsals of same member, at least the median posterior scales distinctly larger than the adjacent lateral posterior scales; femoral pore series separated by eight scales or less; dorsal scales 35 to 47, average 40; males with lateral belly patches and distinct lateral gular patches; dorsolateral light lines distinct in males, indistinct in females; females unmarked ventrally; femoral pores usually 16 or more (70 per cent).

Locality records.[1]—CHIHUAHUA: 10 mi. S of Moctezuma (EHT 13062); 10 mi. S of Chihuahua (EHT 13080); Rio San Pedro between Chihuahua and Naica (EHT 13034–5); 25 mi. S of Jimenez (EHT

[1] United States records not listed.

13036–42); 10 mi. N of Escalón (EHT 13043–5). COAHUILA: 10 mi. E of Torreón (EHT 13029–30); 30 mi. N of El Salado (EHT 13026). DURANGO: 10 mi. S of Escalón (EHT 13046); Yermo (EHT 13047–8); 25 mi. N of Bermejillo (EHT 13049). NUEVO LEÓN: Sabinas Hidalgo (EHT 13033); 31 mi. S of Sabinas Hidalgo (EHT 13031–2). ZACATECAS: La Colorada (EHT 13051–5, 13068).

Sceloporus undulatus virgatus Smith.

Sceloporus undulatus virgatus Smith, Occ. Papers Mus. Zool. Univ. Mich., **387**, p. 11, 1938.

Type locality.—Above Santa Maria Mine, El Tigre Mountains, Sonora. Type UMMZ 81912, collected by Berry Campbell.

Distribution.—Huachuca and Chiricahua Mountains, in Arizona, and El Tigre Mountains in northeastern Sonora, at high elevations.

Diagnosis.—A small *Sceloporus* of the *undulatus* group, maximum snout-vent measurement about 62 mm.; dorsolateral and lateral light stripes very distinct, unbroken; dorsal dark spots small, frequently indistinct; a distinct, broad, dark band below dorsolateral light line; femoral pores 12 to 16; dorsal scales 36 to 42; femoral pore series separated medially by 4 to 7 scales; both sexes immaculate white on belly, with very small blue spots on throat posteriorly, one on each side.

Locality records.—ARIZONA: Chiricahua Mts. (UMMZ 71146–9 [5]); Montezuma Canyon, Huachuca Mts. (UMMZ 69911). SONORA: El Tigre Mts. (UMMZ 78417–21 [13], 81912).

THE GRACIOSUS GROUP

Three forms compose the *graciosus* group, only one of which is found in Mexico, in extreme northern Lower California.

KEY TO FORMS OF THE GRACIOSUS GROUP

1.—Dorsal scales usually 52 or less; dorsolateral light stripes usually very distinct. *g. graciosus*

Dorsal scales 53 or more; dorsolateral light stripes usually indistinct or absent . 2

2.—Adult males with ventrolateral blue patches separated by a whitish midventral area of considerable width; blue on under surface of body not confluent with blue of throat; females less dusky below . . . . . *g. gracilis*

Adult males with ventrolateral blue patches united across midventral line or separated by a narrow whitish interval; blue or black of belly confluent with that of throat; under surface of tail and thighs often colored. *g. vandenburgianus* (p. 176)

Sceloporus graciosus vandenburgianus Cope.

Sceloporus vandenburgianus Cope, Amer. Nat., **30**, p. 834, 1896.

Sceloporus graciosus vandenburgianus Camp, Univ. Calif. Publ., Zool., **17**, p. 67, 1916.

Type locality.—Summit of the coast range, San Diego County, California.

Distribution.—Mountains south of Ventura County, California, south into Lower California.

Diagnosis.—Femoral pore series separated medially by 14 or more scales; the pore series not encroaching onto preanal region, separated from it by a few series of small scales; gular region mottled; never with one or two distinct, blue or black spots posteriorly; dorsal scales 53 or more; dorsolateral light stripes indistinct; adult males with ventrolateral blue patches united across midventral line or separated by a narrow whitish interval; blue or black of belly confluent with that of throat; under surface of tail and thighs often colored.

Locality records.—Specimens have been recorded from the San Pedro Martir Mountains in Lower California, at Agua de las Fresas, Vallecitos, and La Grulla.

THE GRAMMICUS GROUP[1]

Nine species have been described in the *grammicus* group: *dispar* Baird and Girard, *disparilis* Stejneger, *grammicus* Wiegmann, *heterolepis* Boulenger, *heterurus* Cope, *microlepidotus* Wiegmann, *pilsbryi* Dunn, *pleurostictus* Wiegmann, and *rubriventris* Günther.[2] Of these nine forms proposed I recognize four: *grammicus, heterolepis, microlepidotus microlepidotus,* and *microlepidotus disparilis.*

The distribution of the group is compact but extensive, covering all of Mexico, except parts of the coastal regions, from central Chihuahua and northern Coahuila south to the Isthmus of Tehuantepec. One form (*m. disparilis*) invades the southern tip of Texas.

In scutellation the group shows little variation, except as regards the dorsal scales, which exhibit most of the specific and subspecific characters. *S. heterolepis* is most modified, the dorsal scales being highly irregular in size. In dorsal coloration the various members of the group show close relationship, all having a gray ground color, the back with zigzag, narrow lines across it, the lines sometimes broader medially. So far as is known, all forms are arboreal. All except *m. disparilis* live at rather high elevations. *S. microlepidotus* is ovoviviparous, and it is assumed that the other two species are also.

[1] Approximately 989 specimens examined.

[2] *S. microlepidopterus* Herrera, 1889, and *S. microlepis* Boulenger, 1894, are *lapsi calami* for *microlepidotus.*

S. grammicus is the connecting link between the *grammicus* and *formosus* groups. Its closest relative in the latter group is *formosus smaragdinus*, which has a remarkably similar dorsal color pattern and relatively small scales. The members of the *formosus* group also are arboreal and ovoviviparous.

The structural characters which the members of this group have in common and by which they differ from other groups and species of

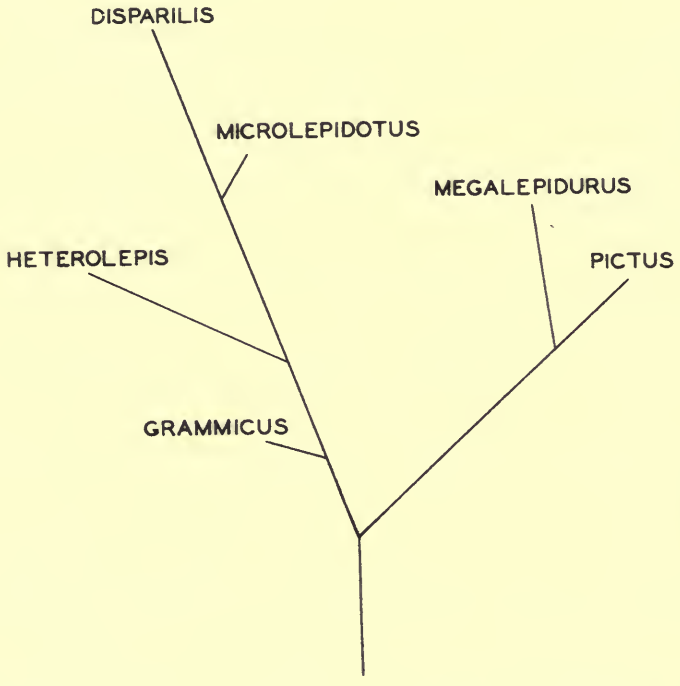

FIG. 15. Phylogeny of the *grammicus* and *megalepidurus* groups.

Sceloporus are: scales on posterior surface of thighs granular; dorsal scales 48 to 93 (as few as 37 in *heterolepis*, counting along one of the series of enlarged scales); moderately large size (maximum snout-vent measurement of largest species, 81 mm.; of smallest species, 64 mm.); no postfemoral dermal pocket; lateral scales in oblique rows; supraoculars numerous, usually in two series; usually four postrostrals; preanals smooth in both sexes; males distinctively colored below; usually a dark blotch in front of arm insertion, with a short, narrow, dorsal extension; and back with several narrow, dark cross-lines.

KEY TO SPECIES AND SUBSPECIES OF THE GRAMMICUS GROUP

1.—Dorsal scales unequal; a series of enlarged scales on each side of mid-dorsal line, separated from each other by small, flat scales. . . . *heterolepis* (p. 197)
Dorsal scales more or less uniform in size. . . . 2

2.—Scales on sides of neck not abruptly differentiated from dorsal nuchal scales; no enlarged series of scales on sides of neck (see fig. 17, p. 185); dorsal scales 48 to 59. . . . *grammicus* (p. 179)
Scales on sides of neck abruptly differentiated from dorsal nuchal scales; two series of enlarged scales on sides of neck posterior to ear (see fig. 18, p. 197); dorsal scales 52 to 93. . . . 3

3.—Dorsal scales usually less than 70 (52 to 74). . . . *m. disparilis* (p. 191)
Dorsal scales usually 70 or more (68 to 93). . . . *m. microlepidotus* (p. 183)

Sceloporus grammicus Wiegmann.

Sceloporus grammicus Wiegmann, Isis, **21**, p. 370, 1828; idem, Herp. Mex., p. 51, 1834; Gravenhorst, Nova Acta Acad. Leop., **18**, pp. 767–768, 1837; Fitzinger, Syst. Rept., **1**, p. 76, 1843; Baird and Girard, in Stansbury, Explor. Great Salt Lake, p. 344, 1852; Duméril, Arch. Mus. Hist. Nat. Paris, **8**, p. 547, 1856; Müller, Reisen Ver. Staaten, Canada, Mex., **3**, p. 602, 1865; Cope, Proc. Acad. Nat. Sci. Phila., **1866**, p. 323, 1867; Westphal-Castelnau, Congr. Scient. France, **35**, p. 285, 1872; Bocourt, Ann. Sci. Nat., Zool., (5), **17**, No. 10, p. 2, 1873; idem, Miss. Sci. Mex., Zool., **3**, sec. 1, pp. 192–194, pl. 18bis, figs. 12, 12 *a*, 12 *b*, 1874; Dugès, Naturaleza, **4**, p. 30, 1877; Cope, Proc. Amer. Phil. Soc., **22**, pp. 395, 397, 1885 (part); Boulenger, Cat. Liz. Brit. Mus., **2**, pp. 218, 231–232, 1885; Cope, Bull. U. S. Nat. Mus., **32**, p. 36, 1887 (part); Dugès, Naturaleza, (2), **1**, p. 112, 1888; Günther, Biol. Cent.-Amer., Rept. Batr., p. 71, 1890 (part); Herrera, Cat. Rept. Mus. Nac., Mexico, p. 18, 1895; Boulenger, Proc. Zool. Soc. Lond., **1897**, pp. 476, 508–509, 1897 (part); Cope, Ann. Rept. U. S. Nat. Mus., **1898**, pp. 335, 392–393, 1900; Herrera, Cat. Rept. Mus. Nac., Mexico, 2nd ed., p. 18, 1904; Smith, Trans. Kans. Acad. Sci., **37**, p. 272, 1934.

Sceloporus pleurostictus Wiegmann, Isis, **21**, p. 370, 1828—"Mexico"; Dugès, Naturaleza, (2), **1**, p. 112, 1888.

Tropidurus grammicus Wagler, Syst. Amph., p. 146, 1830.

Tropidolepis pleurostictus Gray, in Cuvier, Animal Kingdom, Griffith ed., **10**, [App.], p. 43, 1831; Lichtenstein, Nomen. Rept. Amph., p. 9, 1856.

Tropidolepis grammicus Gray, in Cuvier, Animal Kingdom, Griffith ed., **10**, [App.], p. 43, 1831; Duméril and Bibron, Erp. Gén., **4**, pp. 306–307, 1837; Gray, Cat. Liz. Brit. Mus., p. 209, 1845; Duméril and Duméril, Cat. Méth., p. 77, 1851; Lichtenstein, Nomen. Rept. Amph., p. 9, 1856; Jan, Cenni. Rept. Mus. Milano, p. 39, 1857.

Type locality.—Mexico.

Distribution.—Southern Oaxaca.[1]

Diagnosis.—A *Sceloporus* of moderate size, maximum snout-vent measurement approximately 67 mm.; scales on posterior surface of

[1] Boulenger (1885, 1897), records this species from Guatemala. It is likely that his specimens should be referred to *formosus smaragdinus*.

thigh granular; no postfemoral dermal pocket; lateral scale rows oblique; lateral nuchal scales merging gradually with dorsal nuchal scales, not abruptly differentiated from the latter; enlarged postanals present in males; preanals smooth; sides of belly bluish in males; dorsal scales 48 to 59; ventral scales 55 to 57; scales around body 54 to 58; 12 to 15 dorsal scales in head length; femoral pores 13 to 16.

Description.[1]—Head scales smooth, slightly convex, pitted; a prefrontal depression visible, surrounded by weak ridges; interparietal rather irregular in shape, more or less pentagonal, two and one-half to three times as large as either parietal; parietal single on either side; a single, small frontoparietal on each side, separated medially by an azygous scale or by contact of frontal with interparietal; frontal typically divided; six or seven superciliaries in inner row; four or five smaller scales in outer row of superciliaries; one complete and another nearly complete row of small scales between supraoculars and superciliaries, and one complete row between supraoculars and median head scales; six superciliaries, five visible from above; prefrontals separated by contact of frontal and median frontonasal; frontonasals typical; three pairs of internasals; subnasal present, divided into two on both sides in one, on one side in other (one side injured); two canthals, typical in position, the first somewhat smaller than the second; preocular entire; one loreal on each side; four or five postrostrals; two or three postoculars; two rows of lorilabial scales, complete below subocular; four supralabials and six or seven infralabials to a point below middle of eye.

Mental subtriangular, with a labial border two-thirds to three-fourths that of rostral; four or five pairs of postmentals, the scales of the anterior pair in contact medially; anterior scale of outer row of labiomentals separated from mental by partial contact of first postmental and first infralabial; gular scales smooth, weakly notched, except those below ear and near angle of jaws, which are keeled and pointed.

Auricular lobules about four in number, very short, smooth, pointed, subequal in size to or slightly smaller than preceding scales; temporal scales keeled, weakly mucronate, the anterior scales smaller than posterior and subequal in size to median scales between ear and nuchal pocket; a loose skin fold extending obliquely upward from upper edge of nuchal pocket to a point above arm insertion; small axillary scales continuing immediately above arm insertion and forward into nuchal pocket, there becoming granular; dorsal nuchal

[1] Based on USNM 30134–5, "Tehuantepec."

scales not well differentiated from lateral nuchal scales between ear and nuchal pocket; scales of lateral row of dorsals on neck not enlarged or strongly keeled, or otherwise differentiated from temporal or lateral nuchal scales.

Dorsal body scales rather strongly keeled and mucronate, not denticulate, in convergent rows; median lateral scales two-thirds to three-fourths size of dorsal scales, in oblique rows; ventral scales

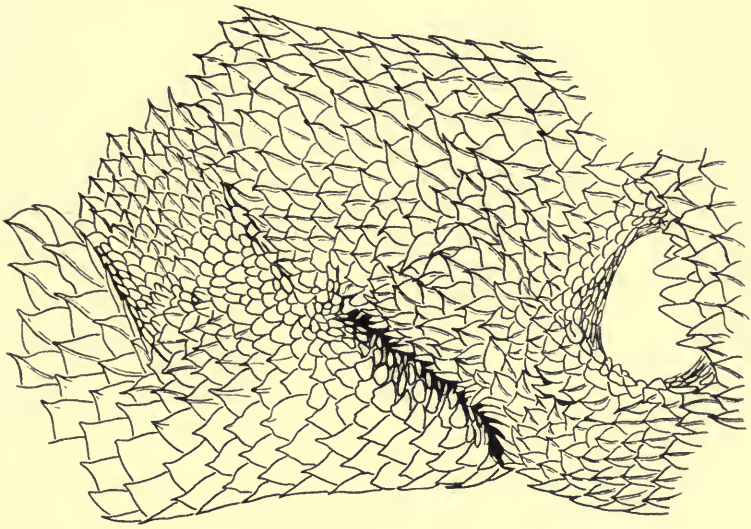

FIG. 16. Lateral nuchal scales of *Sceloporus grammicus*.

somewhat smaller than lateral scales, weakly notched or pointed; scales on chest distinctly larger than median ventral scales.

Dorsal scales of foreleg similar to dorsals on body, except somewhat smaller; scales on anterior surface of lower foreleg smooth, somewhat larger than other scales of same member; ventral scales of lower foreleg keeled, mucronate, denticulate; ventral scales of upper foreleg smooth, notched, one-third to one-half size of ventral scales of lower foreleg; the lamellar formula for the fingers 8–12–16–18–13.

Dorsal scales of hind legs similar in character to dorsal body scales, those on shank slightly smaller than dorsals on thigh and subequal in size to those on body; scales on ventral surfaces of thigh smooth, pointed, decreasing in size toward femoral pore series, increasing in size to anterior surface of thigh; scales on posterior surface of thigh very small, keeled, mucronate, about one-fifth or one-sixth size of

preanal scales; ventral scales on shank smooth, subequal in size to dorsal scales of same member; lamellar formula for toes 7–11–17–19–15 (7–11–17–20–16).

Dorsal caudal scales strongly keeled and mucronate, about one and one-half times as large as dorsals on body; basal subcaudals smooth and notched; subcaudals becoming pointed and keeled distally; enlarged postanals present; no postfemoral dermal pocket.

Color.—Dorsal surfaces dull greenish olive; sides of body darker, with scattered dark spots; gular region with faint bluish bars; chest bluish or white; sides of belly pale blue, bordered by a very narrow blue border; latter edged medially with a very narrow black line, the two lines closely approximated medially; none of the blue belly coloration extending into groin or onto preanal area; ventral surfaces of limbs and tail dusky white. A very narrow, black line extends upward from upper anterior edge of arm insertion a short distance onto sides of neck.

The two specimens examined are so badly faded that it is almost impossible to make out the original pattern or coloration. The color description given by Bocourt (1874, pp. 193–194), who had examined Wiegmann's type, follows (in translation): "Superior regions of a metallic green, sometimes very brilliant, with several narrow, undulate, brown bands joining in chevrons on the middle of the back; the sides darker, showing numerous small, black brown and yellow spots. Below, the males have on the median part of the belly two parallel black bands, closely approximated to each other, each bordered laterally by blue. In some individuals, the gular region is traversed by black; this color extends considerably upon the articulation of the arm, passing upward on each side upon the scapula as a very narrow line, which is interrupted between the shoulders; throat frequently tinted with gray and with small, scattered, whitish dots."

Comparisons.—From *m. microlepidotus*, the present species differs most obviously in the size of the dorsal scales. From *m. disparilis*, the northern parallel of *grammicus*, the latter species differs in certain minor details of squamation: scales on sides of neck between ear and nuchal pocket larger, not sharply differentiated from dorsal nuchal scales (well differentiated in *m. disparilis*), and prefrontal depression distinct, surrounded by weak ridges (very indistinct or absent in *m. disparilis*). The dorsal scales may average larger (less numerous between occiput and base of tail) than in *m. disparilis*.

It is possible though not certain that two specimens of *m. microlepidotus* from "Tehuantepec" (USNM 30132–3) were collected with the two *grammicus*. These two are quite distinct from *grammicus*, with the typical *m. microlepidotus* coloration and 76–83 dorsal scales.

Locality records.—OAXACA: "Tehuantepec" (USNM 30134–5) (probably from the mountains near the middle of the isthmus); Oaxaca (Bocourt, 1874).

Sceloporus microlepidotus microlepidotus Wiegmann.

Sceloporus grammicus var. alpha Wiegmann, **21**, Isis, p. 370, 1828.

Sceloporus microlepidotus Wiegmann, Herp. Mex., p. 51, 1834; Fitzinger, Syst. Rept., **1**, p. 76, 1843; Müller, Reisen Ver. Staaten, Canada, Mex., **3**, p. 602, 1865; Peters, Monatsber. Akad. Wiss. Berl., **1869**, p. 874, 1869; Duméril, Nouv. Arch. Mus. Hist. Nat. Paris, **5**, pp. 48, 52, 1870; Sumichrast, Bibl. Univ. Rev. Suisse, **46**, p. 243, 1873; Bocourt, Miss. Sci. Mex., Zool., **3**, sec. 1, pp. 194–195, pl. 18bis, figs. 13, 13 *a–d*, 1874; Dugès, Naturaleza, **4**, p. 30, 1877; Sumichrast, Naturaleza, **6**, p. 38, 1882; Garman, Bull. Essex Inst., **16**, p. 18, 1884; Cope, Proc. Amer. Phil. Soc., **22**, p. 170, 1885; idem, **22**, pp. 379, 384, 1885 (part); Boulenger, Cat. Liz. Brit. Mus., **2**, pp. 218, 232–233, 1885 (part); Ferarri-Perez, Proc. U. S. Nat. Mus., **9**, p. 193, 1886; Cope, Bull. U. S. Nat. Mus., **32**, p. 36, 1887 (part); Garman, Bull. Essex Inst., **19**, p. 132, 1887; Dugès, Naturaleza, (2), **1**, pp. 112–113, 1888; Günther, Biol. Cent.-Amer., Rept. Batr., pp. 72–73, 1890 (part); Herrera, Naturaleza, (2), **2**, pp. 65, 83, 1891; Ives, Proc. Acad. Nat. Sci. Phila., **1891**, p. 462, 1892; Herrera, Naturaleza, (2), **2**, pp. 330–345, 1893; Boettger, Kat. Rept. Senck. Mus., p. 65, 1893; Blatchley, Proc. U. S. Nat. Mus., **16**, p. 41, 1893 (part); Herrera, Cat. Rept. Mus. Nac., Mexico, p. 18, 1895; Cope, Amer. Nat., **30**, pp. 1021–1023, 1896; Dugès, Naturaleza, (2), **2**, p. 479, 1896; Cope, Ann. Rept. U. S. Nat. Mus., **1898**, pp. 335, 340, 394, 1900 (part); Herrera, Cat. Rept. Mus. Nac., Mexico, 2nd ed., p. 18, 1904; Gadow, Proc. Zool. Soc. Lond., **2**, pp. 195, 214, 230, 232, 1905; idem, Through Southern Mexico, pp. 57, 270, 271, 380, 511, 1908; idem, Zool. Jahr., Syst., **29**, pp. 706, 713, 714, 1910; Stejneger, Proc. Biol. Soc. Wash., **29**, pp. 227–230, 1916; Flower, Vert. Animals Zool. Soc. Lond., **3**, p. 243, 1929; Gadow, Jorullo, pp. 50, 69, 1930; Mertens, Abh. Ber. Mus. Naturk. u. Naturw. Ver. Magdeburg, **6**, p. 158, 1930; Martín del Campo, Anales Inst. Biol. Mexico, **7**, p. 275, 1936; Hesse, Allee, and Schmidt, Ecol. Animal Geogr., p. 501, 1937.

Tropidolepis microlepidotus Duméril and Bibron, Erp. Gén., 4, p. 308, 1837; Gray, Cat. Liz. Brit. Mus., p. 209, 1845; Duméril and Duméril, Cat. Méth., p. 77, 1851; Lichtenstein, Nomen. Rept. Amph., p. 9, 1856; Jan, Cenni Rept. Mus. Milano, p. 39, 1857; Dugès, Naturaleza, **1**, p. 143, 1870.

Uta microlepidota Baird and Girard, in Stansbury, Explor. Great Salt Lake, pp. 344–345, 1852; Duméril, Arch. Mus. Hist. Nat. Paris, **8**, p. 548, 1856.

Sceloporus dispar Baird and Girard, Proc. Acad. Nat. Sci. Phila., **6**, p. 127, 1852—Vera Cruz; Duméril, Arch. Mus. Hist. Nat. Paris, **8**, p. 547, 1856;

Müller, Reisen Ver. Staaten, Canada, Mex., **3**, p. 602, 1865; Dugès, Naturaleza, **4**, p. 30, 1877.

Sceloporus heterurus Cope, Proc. Acad. Nat. Sci. Phila., **1866**, pp. 322–323, 1867—Mirador, Vera Cruz.

Tropidolepis grammicus Dugès, Naturaleza, **1**, p. 143, 1870.

Tropidolepis microlepidus Westphal-Castelnau, Congr. Scient. France, **35**, p. 285, 1872.

Sceloporus grammicus Cope, Proc. Amer. Phil. Soc., **18**, p. 265, 1879; idem, **22**, pp. 395, 397, 1885 (part); idem, Bull. U. S. Nat. Mus., **32**, p. 36, 1887 (part); Günther, Biol. Cent. Amer. Rept. Batr., p. 71, 1890 (part); Dugès, Naturaleza, (2), **2**, p. 479, 1896; Boulenger, Proc. Zool. Soc. Lond., **1897**, pp. 508–509, 1897 (part).

Sceloporus microlepidopterus Herrera, Naturaleza, (2), **1**, p. 331, 1890 (lapsus calami).

Sceloporus rubriventris Günther, Biol. Cent.-Amer., Rept. Batr., p. 72, pl. 32, fig. C, 1890—Omilteme, Guerrero; Boulenger, Proc. Zool. Soc. Lond., **1890**, p. 78, 1890; Cope, Amer. Nat., **30**, p. 1024, 1896; Dunn, Proc. Acad. Nat. Sci. Phila., **88**, p. 474, 1936.

Sceloporus microlepis Boulenger, Proc. Zool. Soc. Lond., **1894**, p. 731, 1894 (lapsus calami).

Type locality.—Mexico.

Distribution.—Southern part of Mexican Plateau, from Jalisco, northern Guanajuato, and northern Hidalgo, to central Oaxaca (fig. 18).

Diagnosis.—A *Sceloporus* of moderate size, maximum snout-vent measurement 81 mm.; scales on posterior surface of thighs granular; no postfemoral dermal pocket; lateral scale rows oblique; lateral nuchal scales abruptly differentiated from dorsal nuchal scales; the scales of the lateral row of dorsal nuchals somewhat enlarged, more strongly keeled than others; dorsal scales 68 to 93, average 77.9; scales around body 60 to 85, average 72.2; ventral scales 51 to 73, average 61.6; femoral pores 13 to 22, average 17; frontoparietals usually single on each side; prefrontals usually in contact; two rows of lorilabials, one usually incomplete; males with enlarged postanals; preanals smooth; dorsal color gray; several crossbars, usually narrow, on back; sides of belly bluish in males.

Description.[1]—Head scales smooth, somewhat convex, strongly pitted; interparietal very large, about four times as large as either parietal, about three-fifths size of supraorbital area; one parietal on each side, small; frontoparietals usually one, frequently two, on each side; frontal generally in contact with interparietal; the two sections of frontal seldom subdivided; supraoculars in two rows, the scales of the outer row about one-third or one-fourth size of scales in

[1] Based chiefly on UMMZ 55758, female, San Juan Teotihuacán.

inner row; usually about seven or eight scales in the inner row of supraoculars; two irregular rows of scales between supraoculars and superciliaries; six superciliaries, five visible from above (rarely five or seven superciliaries); one row of scales, rarely incomplete, between supraoculars and median head scales; prefrontals mostly in contact medially, frequently separated by contact of frontal and median frontonasal, or by an azygous scale; internasals more or less irregular, usually in two pairs; subnasal present; two canthals, generally one

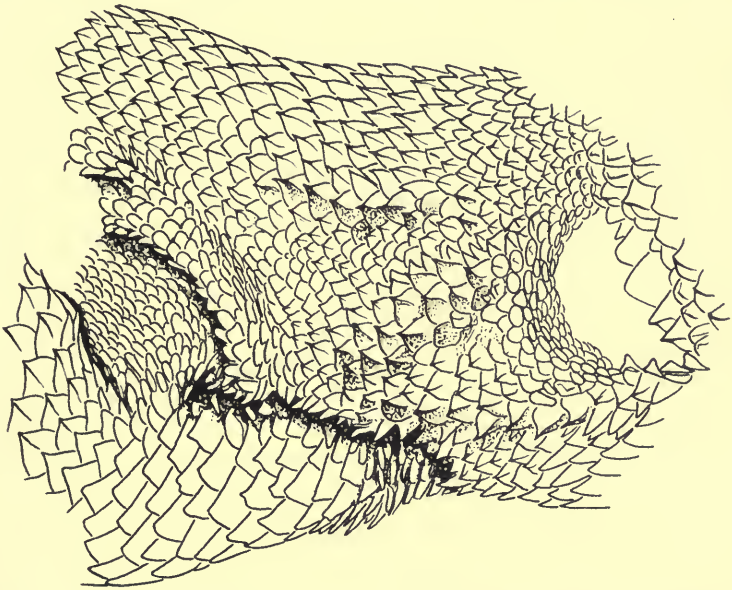

FIG. 17. Lateral nuchal scales of *Sceloporus microlepidotus microlepidotus*.

loreal; preocular usually entire; usually four postrostrals; two rows of lorilabials, frequently reduced to one row below subocular by one or more scales in contact with both subocular and supralabials; two postoculars; four supralabials and five infralabials to a point below middle of eye.

Mental pentagonal, with a labial border about two-thirds that of rostral; outer row of labiomentals narrowly separated from mental by partial contact of first postmental and first infralabial; about six pairs of postmentals, the scales of only the anterior pair in contact medially; gular scales notched (except anterior scales), the notches difficult to discern or absent in young specimens; gular scales more strongly notched toward sides of throat.

Auricular lobules short, smooth, pointed, not extending across ear opening, subequal in size to preceding scales (sometimes slightly larger or smaller); temporal scales keeled, not or weakly mucronate, not denticulate, the median and lower scales smallest, the largest somewhat larger than scales between ear and lateral nuchal pocket; scales immediately behind ear granular, sharply increasing in size posteriorly and ventrally; a fold, surmounted by somewhat enlarged, strongly keeled scales, extending from middle of nuchal pocket to lower edge of ear; another fold, without differentiated scales, passing obliquely upward a short distance onto back, originating at extreme posterodorsal edge of nuchal fold; scales between lower part of nuchal fold and the fold extending to lower edge of ear weakly keeled, mucronate, weakly denticulate; scales between nuchal pocket and arm granular dorsally, much larger and notched ventrally; lateral nuchal scales between ear and nuchal pocket strongly differentiated from dorsal nuchal scales; scales in lateral row of dorsal nuchals strongly keeled, well differentiated from other dorsal nuchal scales, the row abruptly terminating at a point above and slightly posterior to posterior margin of ear.

Dorsal scales keeled, weakly mucronate, weakly (although distinctly) denticulate (the denticulations are not visible on scales whose original epidermal covering is lost); lateral abdominal scales not well differentiated from dorsals, more strongly mucronate and denticulate; ventral scales subequal in size to lateral scales, smooth, notched.

Dorsal scales of foreleg weakly keeled, weakly mucronate; scales at elbow denticulate or notched; dorsal scales of lower foreleg subequal in size to dorsal scales on body, those on upper foreleg slightly larger; posteroventral scales of lower foreleg keeled, usually with two apical notches; anteroventral scales of lower foreleg smooth, with a single apical notch; ventral scales of upper foreleg weakly keeled (anteriorly) or smooth (posteriorly), about one-third size of ventral scales of lower foreleg; lamellar formula for fingers 10–?–20–20–14 (9–15–19–21–16).

Dorsal scales of hind leg about one and one-third times as large as dorsals on body, keeled and mucronate, not or weakly denticulate; scales on anterior surfaces of thigh smooth, notched, the scales becoming smaller on ventral surface toward femoral pore series; scales on posterior surface of thigh very small (granular in young specimens), much smaller than preanal scales, the largest ones (in a central area and adjacent to femoral pore series) keeled, mucronate;

scales on ventral surface of shank smooth, rounded or weakly notched, slightly smaller than dorsal scales of same member; lamellar formula for toes 7–14–18–25–18 (9–14–19–23–17).

Dorsal caudal scales about three (sometimes four) times as large as dorsal body scales, keeled, moderately strongly mucronate; basal subcaudals smooth, rounded or weakly notched in males, becoming keeled, mucronate and weakly denticulate toward tip of tail; basal subcaudals weakly keeled toward sides of tail in females, and somewhat mucronate; enlarged postanals present in males; no postfemoral dermal pocket.

Color.—Dorsal surface in males dark gray, gray-brown, olive-gray, bright olive or light yellowish-brown; in specimens in which the head is marked, a brown lighter band across prefrontal area, bordered posteriorly by a distinct narrow black line; snout dark gray; frequently a W-shaped, narrow, black mark across fronto-parietal area (head frequently uniform brownish or gray, without markings); a narrow black nuchal collar (occasionally absent, notably in central Vera Cruz specimens from very high altitudes), broken medially by a space about six scales wide; the collar may be bordered posteriorly by a distinct narrow white line; a black line extending from posterior edge of orbit across upper edge of ear opening to nuchal collar; this is sometimes bordered above by a narrow white line; a black shoulder patch usually present (absent in specimens from region about Tehuacán, Puebla); the upper part of the area between ear and nuchal pocket may or may not be entirely or partially black (generally black in Vera Cruz specimens); on each side of back a series of about six narrow black lines, each extending forward, then turning posteriorly near middle of back; the lines on one side may alternate or coincide in position with the lines on the opposite side; in some specimens a faint indistinctly outlined dorsolateral light stripe is present; the sides of the abdomen are marked with numerous dark lines, usually narrow, sometimes parallel with the body axis, sometimes oblique; the sides may be mottled, or with series of dark spots sometimes arranged in longitudinal rows; in some specimens the undulate marks on the back extend onto the sides of the abdomen.

Ventral surfaces extremely variable in coloration; usually the chin and infralabial regions are dark, the central part of the throat lighter (perhaps pinkish or lavender in life); the chest is mottled with black; the sides of the abdomen are cyanine blue, bordered medially on each side by a narrow black area not extending across

chest nor into groin; the black borders are separated from each other by a narrow dusky area; ventral surfaces of limbs and tail dusky; tail faintly barred below.

A variant of this ventral coloration occurs in the Sierra Madre Oriental. In these the sides of the gular area are cream, the median gular area pale blue; the gular fold region and anterior part of chest are black, the color continuous with that of a broad median ventral band which expands into the groin and preanal areas and onto the ventral surfaces of the thigh.

In certain specimens the whole gular area is pale blue, the gular fold region black, the chest dusky, the ventral surfaces of the limbs and tail pale blue.

Specimens from the area about Tehuacán, Puebla, are very light in ventral coloration; the median gular area and sides of abdomen are china blue or slightly darker; the infralabial region, chest, and sides of abdomen lateral to the blue patches are stippled lightly with black; the ventral surfaces of the limbs are cream or bluish.

Females are similar to males in general features of the dorsal coloration and markings, except that the color is less brilliant and the dark markings more distinct. Females from the region about Tehuacán have the sides of the abdomen uniform, except for the undulate bars which extend down from the back, and are nearly immaculate below; the labiomental region is faintly stippled. The ventral surfaces are more or less uniform cream or bluish, except the throat, which is usually heavily stippled with black; light-colored scales are scattered over the throat; generally two fairly distinct, parallel dark lines are present near the middle of the throat; the anterior part of the chest may be lightly mottled.

Variation.—The variation in the scutellation of the head in 115 specimens has been recorded. Parietals one to four (1, four; 2, one hundred and seventy-one; 3, fifty-three; four, one); frontoparietals one to three on each side (1, one hundred and seventy-eight; 2, forty-three; 3, five); frontal in contact with interparietal in 97, separated by an azygous scale in 12, by contact of frontoparietals in five; anterior section of frontal variously divided in seven; superciliaries five to seven (5, twelve; 6, two hundred and one; 7, seventeen); three to eight scales in outer row of supraoculars, usually five; supraoculars (inner row) five to ten (5, four; 6, thirty-three; 7, one hundred and fifteen; 8, forty-five; 9, twenty-two; 10, one); one or more supraoculars contact median head scales in six; prefrontals in contact medially in 62, separated by an azygous scale in 27, by contact of frontal

and median frontonasal in 25; median frontonasal separated from lateral frontonasals in one; internasals rather irregular; subnasal present in all; canthals one to three (1, nine; 2, two hundred and nineteen; 3, two); first canthal forced above canthal ridge on both sides in 14, on one side in seven; first canthal in contact with lorilabials in two; loreals none to three (none, thirteen; 1, two hundred and one; 2, eleven; 3, five); postrostrals two to six (2, three; 3, eight; 4, ninety-six; 5, seven; 6, one); lorilabials reduced to one row below subocular by one or more scales in contact with both subocular and supralabials on one side in 20, on both sides in 77.

Dorsal scales 68 to 93, average 77.9 (226 counts: 68, five; 69, four; 70, six; 71, six; 72, twenty-one; 73, ten; 74, fifteen; 75, fifteen; 76, eighteen; 77, twenty; 78, eleven; 79, fifteen; 80, fifteen; 81, seven; 82, ten; 83, twelve; 84, seven; 85, nine; 86, six; 87, four; 88, five; 89, two; 90, one; 93, two). Ventral scales 51 to 73, average 61.6 (127 counts: 51, one; 53, three; 54, two; 56, four; 57, six; 58, ten; 59, thirteen; 60, eleven; 61, thirteen; 62, thirteen; 63, ten; 64, nine; 65, eleven; 66, eight; 67, four; 68, three; 69, one; 70, three; 72, one; 73, one). Scales around body 60 to 85, average 72.2 (129 counts: 60, one; 62, two; 63, one; 64, three; 65, three; 66, four; 67, four; 68, nine; 69, twelve; 70, nine; 71, eleven; 72, fifteen; 73, six; 74, ten; 75, twelve; 76, six; 77, three; 78, five; 79, six; 80, one; 82, two; 83, two; 84, one; 85, one). Femoral pores 13 to 22, average 17 (243 counts: 13, one; 14, six; 15, thirty; 16, fifty-eight; 17, fifty-seven; 18, fifty-two; 19, twenty-seven, 20, seven; 21, four; 22, one).

Two specimens from Cerro de San Luis, north of Oaxaca, are exceptional in having the dorsal scale count 61, 63. Specimens from parts of Guerrero and Oaxaca have a lower average dorsal count than the average for the whole subspecies, but do not differ sufficiently to warrant recognition. Specimens from Vera Cruz have a higher average than others; the highest counts for the subspecies occur in this area.

This subspecies tends strongly toward formation of local populations which differ from each other in various minor characters such as details of coloration, average dorsal scale count, and size of supraoculars; the populations are not, so far as I can determine, sufficiently well marked to be differentiated from other populations. The population areas which seem best defined are: Vera Cruz, western and northern Puebla; Guerrero and central Oaxaca; valley of Mexico northward over the southern half of the Mexican plateau, including the inward slopes of adjacent mountain ranges.

The dorsal scale count 70 has arbitrarily been assumed as the point of division between *m. microlepidotus* and *m. disparilis*. Nine out of 226 *m. microlepidotus* are under this count (4 per cent), and three out of 127 *m. disparilis* are over this count (2.4 per cent). Using this character alone, 3.4 per cent of the total number of specimens counted of both subspecies are confused.

Habits and habitat.—The subspecies is completely arboreal, as is its relative *m. disparilis*. In many places it is exceedingly common. Specimens are observed most frequently in open woods where plenty of sunlight is available. In the early hours of the morning and on cool days they are frequently found under bark. Specimens have been recorded from elevations of 13,500 feet on Mount Orizaba, and 11,200 feet on Mount Ixtaccihuatl.

As recorded by Herrera, Gadow, and others, *m. microlepidotus* is ovoviviparous. Schmidt (Hesse, Allee, and Schmidt, 1937, p. 501) states that "on Mount Orizaba in southern Mexico, the iguanid lizard, *Sceloporus microlepidotus*, is oviparous at the base and viviparous at high levels, the eggs at intermediate levels doubtless undergoing part of their development in the mother's body." He believes this statement to be derived from Gadow; but he and I together have been unable to find the source for this statement in the literature.

Locality records.—COLIMA: (Bocourt, 1874). DISTRITO FEDERAL: Mexico City (CAS 73470; USNM 18990–6, 81922; ANSP 11721, 11444–5; MCZ 4528[2], 4530[2], 16428); Chapultepec (ANSP 8516); Tacubaya (MCZ 6733[3]); Coyoacan (MCZ 4778); 1 mi. W of Los Remedios (AMNH 15489); 2 mi. W of Tacuba (AMNH 15491, 15532–8); 2 mi. S of San Miguel Peak, Ajusco Range (AMNH 17984–5); San Juanico (AMNH 15594, 15598, 15571–81); N of Guadelupe (AMNH 15606); ruins of El Desierto (AMNH 15548–51, 15555–70); Tlalpam (FMNH 17097); Tlamacas (Herrera, 1893); La Cruz (Herrera, 1893); Xochimilco (Gadow, 1905); Contreras (Gadow, 1905). GUANAJUATO: (USNM 12685); 3 mi. NE of Santa Rosa (EHT 9819–21); Santa Rosa (USNM 47784–6); Tupataro (USNM 10236); San Diego de la Union (USNM 46875–6). GUERRERO: Tamazulapam (USNM 47600); Mts. near Chilpancingo (USNM 47601–3); Chilpancingo (MCZ 33905); Iguala (Gadow, 1905); Omilteme (Gadow, 1905). HIDALGO: Yolotepec (WM 1); 55 mi. N of Mexico City (EHT 9540–4); Tulancingo (USNM 47374–7, 46775–6); Marques (USNM 47523); Pachuca (USNM 47772–3, 47293–5); Zacualtipan (USNM 14746, 16023–4, 16026); Velasco (UMMZ 71441); La Mora (Martín del Campo, 1936); Canguihuindo (Mar-

tín del Campo, 1936). JALISCO: Nevado de Colima (Gadow, 1905). MEXICO: Amecameca (WM 1; FMNH 1300 [24]); San Juan Teotihuacán (CAS 54633–4; USNM 19015; MCZ 6339 [19]; UMMZ 55758[6]); Lumbrera (MVZ 8861, 8867–9); El Tajo de Tequixquiac (MVZ 8854–60, 8862–5); Lerma (EHT 9750, 9822); 2 mi. S of San Martin (EHT 9823–6); 35–40 mi. E of Mexico City (EHT 9652–5); Nevado de Toluca (EHT 9686–7); Popocatepetl (USNM 47281–5; MCZ 16076–87); Valley of Mexico and Toluca (USNM 32288); Valley of Mexico (USNM 2953[16]; MCZ 33906–10); Salazar (USNM 47296, 46896); San Andres (ANSP 8521); Ixtaccihuatl (ANSP 8517); Toluca (ANSP 12562); Zumpango (AMNH 15539); Zacatal (AMNH 14222–3); Chalco (FMNH 1002 [14], 1278 [23]); Texcoco Lake (FMNH 1004[9]). MICHOACÁN: 15 mi. SE of Zitacuaro (EHT 9749); Uruapan (EHT 9559–9637, 9833–5). MORELOS: Tres Marias (EHT 9757–77, 9689–9700); 5–6 km. S of Tres Marias (EHT 9778–9, 9545–8); 9–14 km. S of Tres Marias (EHT 9780–92, 9549–58, 9701–7); Zempoala (EHT 9638–51, 9683–5); 40 leagues S of Mexico City (USNM 2950); Cuautla (FMNH 17098, 1280[7], 1304[3]); Cuernavaca (FMNH 17099). OAXACA: Cerro de San Luis, N of Oaxaca (EHT 9836–7); "Tehuantepec" (USNM 30132–3); Mts. near Ozolotepec (USNM 47846); Reyes (USNM 47369); Cerro San Felipe (USNM 47388–90); Valley of Miahuatlan (AMNH 17977). PUEBLA: (MCZ 9553); Cañada de Morelos (EHT 9744); Tehuacán (WM 2); Rio Frio (EHT 9745–8, 9797–9818); 20 km. N of Tehuacán (EHT 9655A, 9656–63); 15 mi. E of San Marcos (EHT 9708); Teziutlan (MCZ 7472; FMNH 1341[20]); Mt. Orizaba (USNM 4787–8, 47290, 47767–8; FMNH 1518[15]); Chalchicomula (USNM 19022–8; MCZ 16438–40); Atlixco (USNM 47036; FMNH 1302[3]); Huauchinango (USNM 47822–8); Santa Catarina (AMNH 18514, 18516–7, 18746–7, 18750–2); Puebla (FMNH 1323[9]; AMNH 18497–500, 18777–89; FMNH 1003[2], 1324[20]); Cholula (AMNH 18486–96); Tochimilco (USNM 46777); Tlapanalá (Izucar de Matamoros) (Ferrari Perez, 1886). VERA CRUZ: (?)Tierra Colorada (EHT 9709, 9793); Cruz Blanca (EHT 9710–3, 9794–6, 9664–80); Jico (USNM 47372); Cofre de Perote (USNM 47381–6); Mt. Orizaba (USNM 47615–26, 19020–1; ANSP 8518–20); Maltrata (USNM 19009–11); Orizaba (USNM 30191–4); Mirador (USNM 25064); Xuchil (USNM 58691–2; FMNH 1520[9]); Jalapa (Cope, 1885).

Tancita

Sceloporus microlepidotus disparilis Stejneger.

Sceloporus dispar Bailey, N. Amer. Fauna, **25**, p. 42, 1905; Strecker, Baylor Bull., **18**, No. 4, p. 21, 1915; Stejneger, Proc. Biol. Soc. Wash., **29**, p. 227, 1916.

Sceloporus microlepidotus Boulenger, Cat. Liz. Brit. Mus., **2**, pp. 218, 232–233, 1885 (part); Günther, Biol. Cent.-Amer., Rept. Amph., pp. 72–73, 1890 (part); Cope, Ann. Rept. U. S. Nat. Mus., **1898**, p. 394, 1900; Mosauer, Herpetologica, **1**, p. 5, 1936.

Sceloporus ornatus Boulenger, Proc. Zool. Soc. Lond., **1890**, p. 78, 1890; Günther, Biol. Cent.-Amer., Rept. Amph., p. 72, 1890; Boulenger, Proc. Zool. Soc. Lond., **1897**, pp. 485–486, 1897.

Sceloporus grammicus Cope, Proc. Amer. Phil. Soc., **23**, pp. 283, 287, 1886; Garman, Bull. Essex Inst., **19**, p. 132, 1887; Cope, Bull. U. S. Nat. Mus., **32**, p. 36, 1887 (part); idem, Ann. Rept. U. S. Nat. Mus., **1898**, pp. 335, 392–393, 1900 (part).

Sceloporus disparilis Stejneger, Proc. Biol. Soc. Wash., **29**, pp. 227–230, 1916; Stejneger and Barbour, Check List N. Amer. Amph. Rept., p. 53, 1917; idem, 2nd ed., p. 55, 1923; idem, 3rd ed., pp. 60–61, 1933; Burt, Trans. Kans. Acad. Sci., **38**, pp. 276, 278, 299, 305, 1936; Mulaik, Copeia, **1936**, p. 72, 1936; Gaige, Univ. Mich. Stud., Sci., **12**, pp. 301–304, 1937; Burt, Papers Mich. Acad. Sci., **22**, pp. 534, 535, 1937.

Sceloporus microlepidotus disparilis Dunn, Proc. Acad. Nat. Sci. Phila., **88**, p. 472, 1936.

Sceloporus microlepidotus microlepidotus Dunn, Proc. Acad. Nat. Sci. Phila., **88**, pp. 472–473, 474, 1936.

Sceloporus pilsbryi Dunn, Proc. Acad. Nat. Sci. Phila., **88**, pp. 473–474, 1936—Alvarez, San Luis Potosí—type ANSP 20085.

Type locality.—Lomita Ranch, six miles north of Hidalgo, Texas. Type USNM 33041, collected by William Lloyd.

Distribution.—Northern Hidalgo and Guanajuato and southern Zacatecas northward to central Chihuahua and northern Coahuila; in Nuevo León and Tamaulipas to the southern tip of Texas (fig. 18).

Diagnosis.—A *Sceloporus* of moderate size, maximum snout-vent measurement 71 mm.; scales on posterior surface of thighs granular; no postfemoral dermal pocket; lateral scale rows oblique; lateral nuchal scales abruptly differentiated from dorsal nuchal scales; the scales of the lateral row of dorsal nuchals somewhat enlarged, more strongly keeled than others; dorsal scales 52 to 74, average 62; scales around body 50 to 71, average 61.5; ventral scales 49 to 65, average 58.3; femoral pores 12 to 20, average 15.4; frontoparietals usually divided on each side; prefrontals usually separated; usually two complete rows of lorilabials; males with enlarged postanals; preanals smooth; dorsal color gray; several crossbars on back, usually narrow; belly bluish in males.

Description of type.[1]—"Adult male. Head-shields smooth; two canthal scales, between the posterior of which three larger [frontonasal] shields cross the snout; frontal shield divided transversely;

[1] From Stejneger, Proc. Biol. Soc. Wash., **29**, pp. 228–229, 1916.

posterior frontal broadly in contact with interparietal; interparietal very large, much broader than long and fused with the parietals; five large transverse supraorbitals separated from the frontals and interparietal by a single series of scales and from the superciliaries by a double row of scales; six supralabials separated from the nasals and from the long subocular by a single row of scales; fifth supralabial under the center of the eye; anterior border of the ear opening protected by about five, small, slightly projecting scales; dorsal scales about the same size as ventrals, rounded behind, distinctly keeled, forming slightly oblique longitudinal series converging toward the median line back of the shoulders; about 65 scales along the middle line of the back from the shielded part of the head to the base of the tail; 17 scales in the middle of the back corresponding to the shielded part of the head; lateral scales directed upward and backward, scarcely different in size from the dorsals; ventral scales smooth, rounded behind, entire; scales on throat distinctly smaller than ventrals; adpressed hind limb reaches the anterior border of the ear; tibia slightly shorter than the shielded part of the head; the distance between the base of the fifth toe and extremity of the fourth exceeds by a half millimeter the distance between the end of the snout and the ear; 16–17 femoral pores; caudal scales much larger than dorsals, the keels ending in a point beyond the posterior border of the scales; two enlarged postanals."

Color.—Ground color (in females from Texas) light gray; two narrow parallel black lines, one on either side of mid-dorsal line, extending from anterior part of nape a varying distance onto the back (never farther than middle of back); a narrow black line extending laterally and slightly anteriorly from the nuchal lines at a point approximately even with axilla to a point in front of arm insertion, there joining another narrow black line extending posteriorly onto proximal part of foreleg; a narrow black line extending from posterior margin of orbit through upper edge of ear to a point above arm insertion, there joining the line extending laterally; a narrow black line curving upward and posteriorly from extreme posterior upper margin of orbit, sometimes reaching the longitudinal nuchal lines, sometimes terminating on upper part of temporal region; a series of four or five narrow black undulate bars on each side of back, those of the two sides coinciding in relative position or not; each transverse bar on back expanded near mid-dorsal line; sides of body not or somewhat mottled with black; lower foreleg with very distinct narrow black bars; hind leg irregularly barred;

tail with narrow black bars separated from each other by about three scales; posterior surface of thighs reticulated with black and gray; head with numerous narrow black lines, the most constant of which are: a vertical line below orbit; anterior to this a line extending obliquely forward from orbit to supralabials; a line on or below canthus; a line across frontonasals; one across anterior section of frontal. A few black flecks on throat and sides of abdomen; venter otherwise immaculate, whitish.

Adult males (in Texas) lose almost all trace of the dorsal markings; the only distinct dorsal mark is the nearly vertical one in front of arm, extending to mid-dorsal region; it is expanded somewhat in front of arm insertion. Throat finely mottled or stippled with black; central region of throat usually flesh color, sometimes pale blue; a narrow or broad black line across gular fold region, present or not; sides of belly pale blue (appears flesh color in preserved specimens), bordered medially by a short, narrow, black border; chest somewhat mottled in some specimens; remainder of ventral surfaces whitish.

The variation in coloration of specimens from Texas is relatively little, although males have been observed which have the belly and throat colored in a highly variable fashion. The general characteristics of Texas specimens are the very distinct markings in the females and the reduction of the amount of mottling on the sides of the body.

Males from Mexico show a highly variable ventral coloration, and both sexes have the sides of the body somewhat mottled, although usually not so strongly mottled as in typical *m. microlepidotus*. In males as small as 41 mm. from snout to vent, the gular black collar is complete ventrally; the throat varies enormously in coloration, even in juvenile specimens; in some the throat is heavily mottled and stippled with black, with a few minute light blue spots scattered over its surface; in others the stippling is confined to the labial regions; in some the median part of the throat is pale blue, in others pink; in older specimens the black median ventral borders may be united, extending across the chest and joining with the gular collar. So far as I can determine there is little correlation of these color variants with size, and as all phases occur in a single restricted area, I have not attempted to segregate more than one species or subspecies.

Variation.—The variation of the head scales in 83 specimens is as follows: parietals one to three (1, five; 2, one hundred and sixteen; 3, forty-four); frontoparietals one to three (1, sixty-eight; 2, seventy-

five; 3, twenty); frontal touches parietal in 61, separated by an azygous scale in 13, by contact of frontoparietals in eight; posterior section of frontal transversely divided in one; anterior section of frontal variously divided in nine; superciliaries four to seven (4, one; five, four; 6, one hundred and forty-nine; 7, twelve); none to seven scales in outer row of supraoculars, usually four or five; supraoculars four to eight (4, seven; 5, sixty; 6, seventy-six; 7, twenty; 8, one); prefrontals contact medially in 14, separated by an azygous scale in 33, by contact of frontal and median frontonasal in 37; usually two or three regular pairs of internasals, the scales frequently irregular; subnasal present in all; canthals one to three (1, six; 2, one hundred and fifty-nine; 3, one); first canthal forced above canthal ridge on both sides in two, on one side in four; first canthal in contact with lorilabials on one side in two; preocular divided on both sides in 20, on one side in 8; loreals none to three (none, one; 1, one hundred and thirty-six; 2, twenty-four; 3, five); postrostrals two to five (2, six; 3, ten; 4, sixty-five; 5, two); lorilabials reduced to one row below subocular by contact of one or more scales with both subocular and supralabials on one side in 15, on both sides in 20.

Dorsal scales 52 to 74, average 62 (127 counts: 52, one; 55, two; 56, six; 57, six; 58, six; 59, nine; 60, fourteen; 61, fifteen; 62, fifteen; 63, fourteen; 64, eleven; 65, nine; 66, four; 67, three; 68, five; 69, four; 71, one; 72, one; 74, one). Ventral scales 49 to 65, average 58.3 (93 counts: 49, one; 51, one; 52, three; 54, seven; 55, five; 56, seven; 57, eleven; 58, eleven; 59, ten; 60, ten; 61, eight; 62, six; 63, nine; 64, two; 65, two). Scales around body 50 to 71, average 61.5 (101 counts: 50, one; 52, one; 53, one; 54, four; 55, two; 56, five; 57, five; 58, six; 59, eleven; 60, seven; 61, eight; 62, four; 63, fourteen; 64, eight; 65, four; 66, six; 67, six; 68, three; 70, two; 71, three). Femoral pores twelve to twenty, average 15.4 (175 counts: 12, one; 13, twelve; 14, thirty-six; 15, fifty-one; 16, thirty-nine; 17, twenty; 18, five; 19, nine; 20, two).

Remarks.—Sceloporus pilsbryi Dunn was based upon an adult male of *m. disparilis* with a broad gular collar and certain other features of ventral coloration not found frequently in the subspecies. The large supraoculars mentioned in the description occur occasionally in this form; they are not large, however, in comparison with the supraoculars of members of the *spinosus* or *poinsettii* group. The type is obviously identical with other Mexican *m. disparilis*. It is of importance to note that the dorsal scales were inadvertently recorded as 49, in the original description; the count actually is 59.

Habits and habitat.—So far as known, these lizards are confined to an arboreal habitat. In southern Texas, where Dr. Taylor and I found them to be abundant, they are restricted to mesquite trees. They are exceedingly wary and at best difficult to distinguish from the similarly colored bark. As we found it difficult to collect them alone, we searched for them together with success. As it is their habit to retreat to the side of the tree opposite to that upon which one approaches, one of us would station himself on one side of the tree within gunshot of any possible lizards, while the other would beat the trunk and limbs on the opposite side, scaring the lizards to the side upon which they could be seen and shot.

In central Nuevo León and northern San Luis Potosí, the species is fairly abundant in yuccas, trees being absent. In heavily wooded regions they are found on the larger trees.

Mulaik (1936, p. 72) gives an interesting account of their life history. He finds that *disparilis* is ovoviviparous.

Locality records.—TEXAS: CAMERON CO.: Brownsville (MCZ 13828). DUVAL CO.: (Boulenger, 1897). HIDALGO CO.: Mercedes (CM 388); 4 mi. S of Alamos (UMMZ 74745); Ojo de Agua (UMMZ 74792); Edinburg (UMMZ 79533, 79534[2], 79442; USNM 95865); Lomita Ranch, 6 mi. N of Hidalgo (USNM 33041–5). STARR CO.: Near Los Olmos Bridge, Rio Grande City (MCZ 33551–3; KU 15081; EHT 9853–66); Arroyo El Salado (KU 11000–4); Rio Grande City (KU 14945–8).

CHIHUAHUA: (USNM 8311); Sierra Madre near Colonia Garcia (ANSP 15365; USNM 26610, 26598, 47255–6; BYU 2030–2); Samachique (FMNH 25942); Pacheco (MCZ 15607–9; Madera (MCZ 17531–4); Meadow Valley (USNM 26611); Sierra Madre (USNM 47542–5). COAHUILA: Sierra Guadelupe, S of El Cuchillo (ANSP 20128; USNM 46701); Del Carmen Mts. (FMNH 25307–9); Buenavista (USNM 2746); Carneros (USNM 46870); 30 mi. N of El Salado, San Luis Potosí (EHT 9753). DURANGO: Ciudad (Boulenger, 1885); Ventanas (Boulenger, 1885). GUANAJUATO: San Felipe (EHT 9751–2, 9829–32). HIDALGO: Cuesta Colorada, 10 km. N of Jacala (EHT 9531–5); La Placita, 8 km. S of Jacala (EHT 9536–7); Minas Viajas (EHT 9538–9); Durango (EHT 9681–2, 9688); Jacala (WM 2). NUEVO LEÓN: Pablillo (ANSP 20121–2); 3 mi. W of Sabinas Hidalgo (EHT 9839, 9850–2, 9867–72). SAN LUIS POTOSÍ: Alvarez (ANSP 20085; UMMZ 67689[5]; MCZ 20047–58, 20060–1; SDSNH 16309); Charcas (UMMZ 77284[4], 77285[8], 77286[5], 77287[12], 77288[2]); Moctezuma (UMMZ 77283); Sierra

de San Miguelito, about 30 mi. S of San Luis Potosí (MCZ 5432, 5433[6]); Mts. near San Luis Potosí (USNM 47160); 15 mi. S of Valles (EHT 9755–6); Coronado (EHT 9754, 9828); between El Salado and San Miguel (EHT 9839); Villa de Guadelupe (EHT 9827). TAMAULIPAS: Miquihuana (USNM 46736–8); Tamaulipeca (UMMZ 69238[13], 69239[9], 69240[10], 69241–2); Mier (USNM 47711). ZACATECAS: Plateado (USNM 46627, 46631–3); 10 mi. S of Majoma (EHT 9840–9).[1]

Sceloporus heterolepis Boulenger.

Sceloporus heterolepis Boulenger, Proc. Zool. Soc. Lond., **1894**, pp. 724, 731, pl. 48, fig. 4, 1894; Cope, Amer. Nat., **30**, p. 1024, 1896; Boulenger, Proc. Zool. Soc. Lond., **1897**, pp. 476, 511–512, 1897; Gadow, Proc. Zool. Soc. Lond., **2**, p. 232, 1905; idem, Jorullo, p. 49, 1930.

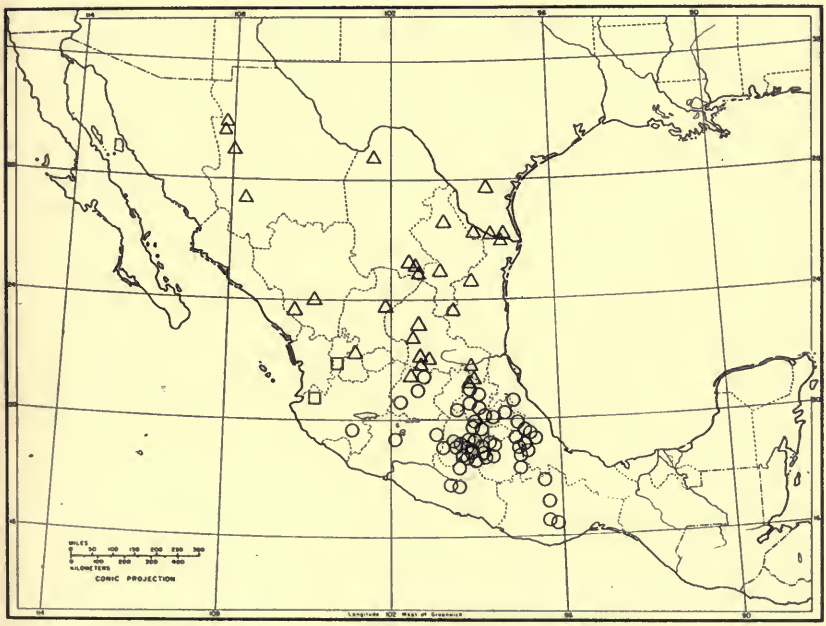

FIG. 18. Distribution of the forms of the *grammicus* group: *Sceloporus heterolepis*, □; *S. microlepidotus microlepidotus*, ○; *S. m. disparilis*, △.

Type locality.—State of Jalisco (La Cumbre de los Arrastrados, Real Alto, Riocho La Berberia, Sierra de Bolaños). One cotype in MCZ (No. 32346); other cotypes in British Museum.

Distribution.—Known only from Jalisco (fig. 18).

[1] UMMZ 71445 is a *disparilis*. It is said to be from Matagalpa, Nicaragua, evidently erroneously.

Diagnosis.—A *Sceloporus* of moderate size, of the *grammicus* group (maximum snout-vent measurement, 64 mm.); dorsal scales highly irregular in size and carination; two irregular series of enlarged, keeled scales on either side of mid-dorsal line, separated from each other by smaller scales.

Description.[1]—Head scales somewhat rugose; frontal ridges distinct, not sharp; interparietal very large, about four times as large as either parietal; frontal broadly in contact with interparietal and median frontonasal; supraoculars 5–6, separated from median head scales by a series of very narrow, small scales; one supraocular touches posterior section of frontal on one side; two supraoculars on each side with a small lateral section split off; supraoculars separated from superciliaries by one series of small scales; internasals irregular; two canthals, the first forced above canthal ridge by contact of second canthal and subnasal; subnasal and loreal large; one row of lorilabials on either side; lorilabials and labials smooth; preocular entire.

Outer row of labiomentals short, separated from mental by contact of first and part of second infralabials with postmentals; scales of the first pair of postmentals in contact medially; gular scales weakly notched.

Auricular lobules very short, smaller than scales preceding; some of temporal scales relatively very large; an oblique series of long, projecting scales below ear; a series of similar scales behind ear; scales immediately posterior to ear relatively small; a longitudinal series of enlarged scales behind and above ear, extending to a point above arm.

A series of enlarged, keeled scales on each side of mid-dorsal line, beginning at occiput, converging at middle of neck (here separated by about one or two rows of small scales), diverging on back and becoming indistinguishable posteriorly; scales from occiput to base of tail 37 to 71, partly smooth, partly keeled, none mucronate; ventral scales smaller in general than those on back, notched, not larger than preanals.

Scales on posterior surface of thigh slightly smaller than preanal scales; dorsal caudal scales larger than smaller scales on back, somewhat irregular toward base of tail, more regular distally; lamellae on fourth toe 20–21; femoral pores 16–16; postanal scales enlarged in males; no postfemoral dermal pocket.

[1] Based on MCZ 32346, La Cumbre de los Arrastrados.

Color.—General ground color light gray; numerous, undulate dark marks on head, one of the two most conspicuous passing across orbits, the other across canthal and frontonasal region; a very narrow, dark brown scapular collar, divided medially, similar to that in *microlepidotus;* about four faint, brown, undulate bars passing across back; tail with distinct, complete bars; limbs with very faint, broad bars above. Throat with irregular dark marks; a light, immaculate white median band two scales wide, extending from middle of throat through to upper third of abdomen; sides of belly pale blue, bordered medially by dark blue, which does not pass onto chest; ventral surfaces of limbs with faint irregular dark marks.

Variation.—USNM 64665 compares well with the MCZ cotype, except that the two canthals are normal, and there are two complete rows of lorilabials; two postrostrals are present. Femoral pores 14 to 19, average 16.8 (30 counts: 14, two; 15, three; 16, ten; 17, eleven; 18, three; 19, one).

Habits and habitat.—Boulenger (1894) states that the species occurs at altitudes between 7,800 and 8,500 feet.

Locality records.—La Cumbre de los Arrastrados (MCZ 32346); La Laguna (USNM 64665); Real Alto, Riocho La Berberia, Sierra de Bolaños (Boulenger, 1894, p. 731).

THE MEGALEPIDURUS GROUP[1]

Two species are grouped together as a distinct section, the *megalepidurus* group. These are *S. megalepidurus* and *pictus.* The characters common to these species are: dorsal scales relatively small (44 to 62 from occiput to base of tail); lateral scales but slightly smaller than dorsal scales; lateral scales in oblique rows; scales on posterior surface of thigh nearly as large as preanal scales; ventral scales smooth, notched; no postfemoral dermal pocket; preanal scales smooth; subcaudal scales keeled except at base of tail; four postrostrals; head scales smooth; frontal with a single, transverse suture; two rows of enlarged supraoculars; usually one canthal, rarely two; scales on sides of neck not greatly reduced in size, except in a narrow area between arm and nuchal pocket; enlarged postanals distinct in males; lineate pattern; small size (maximum snout-vent measurement 54.3 mm.).

The *megalepidurus* group is apparently most closely related to the *grammicus* group. It differs greatly in color pattern, and in size of scales on sides of neck and on the posterior surface of thigh.

[1] Specimens examined, 136.

S. pictus, having larger scales than *megalepidurus* and a belly coloration typical for the genus in the males, is considered the more primitive of the two species (see diagrammatic representation of phylogeny).

KEY TO SPECIES OF THE MEGALEPIDURUS GROUP

Dorsal scales 44 to 56; scales between femoral pore series two to five; basal subcaudals keeled in females; males with distinct blue areas on sides of belly. *pictus* (p. 200)

Dorsal scales 54 to 62; scales between series of femoral pores four to eight; basal subcaudals smooth in females; males immaculate below. *megalepidurus* (p. 199)

Sceloporus pictus Smith.

Sceloporus consobrinus Boulenger, Cat. Liz. Brit. Mus., **2**, pp. 229–230, 1885 (part); Günther, Biol. Cent.-Amer., Rept. Batr., pp. 69, 70, 1890 (part); Boulenger, Proc. Zool. Soc. Lond., **1897**, pp. 486–488, 1897 (part).

Sceloporus pictus Smith, Amer. Mus. Nov., No. 892, pp. 1–4, 1936.

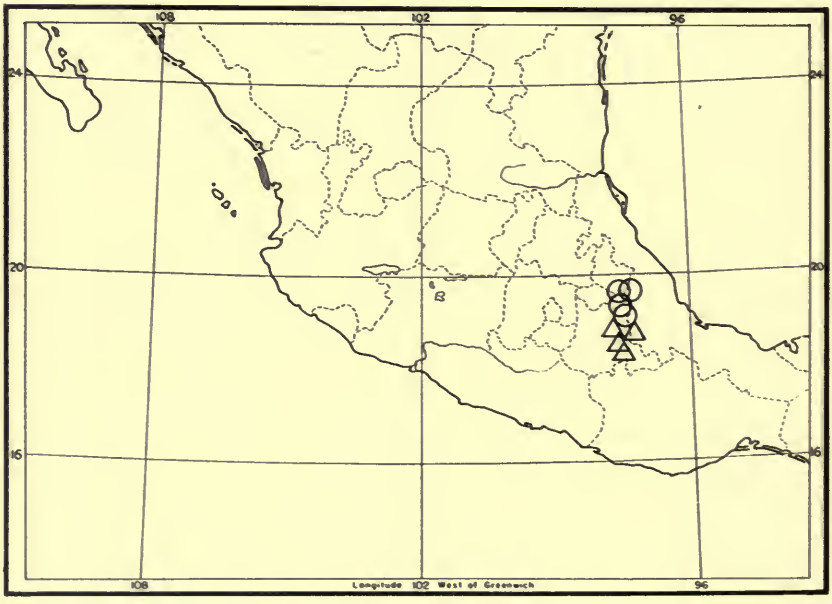

FIG. 19. Distribution of *Sceloporus megalepidurus*, ○; and *S. pictus*, △.

Type locality.—Santa Catarina, Puebla. Type AMNH 18744, male, collected by Paul D. R. Rüthling.

Distribution.—Central western Vera Cruz and central Puebla.

Diagnosis.—A *Sceloporus* of small size, maximum snout-vent measurement approximately 55 mm.; dorsal scales 44 to 56 from

occiput to base of tail, average 49.6; lateral scales in oblique rows converging dorsally; scales around middle of body 45 to 53, average 49.1; femoral pores 13 to 20, average 16.6, the two series separated by two to five scales, average 3.5; usually one, rarely two canthals; frontoparietals usually entire; auricular lobules three to five, the upper lobule usually longest; caudal scales about twice as large as median dorsal scales on body; subcaudals keeled except near base of tail, more strongly keeled in females than in males; preanal scales smooth; ventral abdominal scales about half as large as median dorsal scales on body; no postfemoral dermal pocket. General dorsal color gray-olive or brown-olive; a broken, clove-brown band on each side of the body, bordered above and below by a narrow light line; limbs narrowly banded; a dark spot in front of shoulder; males with dark blue areas on sides of belly, black-bordered medially.

Description of type.—Head scales smooth, weakly pitted; interparietal large, longer than broad, broader posteriorly than anteriorly, its posterior edge rounded; a single parietal on each side, one-fourth or one-fifth size of interparietal; a moderately large scale posterior to parietal which might be considered a secondary parietal, but which appears to be two nuchal scales fused together; a pair of very small, rectangular frontoparietals, separated medially by broad contact of the frontal and interparietal; frontal transversely divided, the posterior section two-thirds as large as anterior section; prefrontals moderate in size; separated medially by contact of frontal and median frontonasal; latter scale somewhat larger than either lateral frontonasal; a pair of narrow scales in front of median frontonasals, preceded by another similar pair of scales; five enlarged supraoculars on each side, the median scale divided on one side; two anterior supraoculars abnormally in contact with median head scales on each side; other supraoculars separated from median head scales by a row of small scales; one complete and another incomplete row of scales separating supraoculars from superciliaries; six superciliaries on each side, normal; one canthal on each side; subnasal present, larger than loreal; preocular not divided; subocular long, single, followed posteriorly around margin of orbit by two keeled postoculars; two incomplete rows of lorilabials, reduced to one row below subocular; one row of lorilabials continuous around end of snout; three and one-half or four supralabials to a point below middle of eye.

Mental pentagonal, with a labial border about half that of rostral; outer row of labiomentals separated from mental by narrow contact of first postmental and first infralabial; three pairs of well-

differentiated postmentals, followed by several scales not well differentiated from adjoining gular scales; first pair of postmentals in contact medially; most of gular scales with a single apical notch; gular scales all nearly equal in size, somewhat smaller than scales on breast, smallest below ear and between postmentals.

Auricular lobules three–four, the upper scale on one side considerably larger than the others (apparently injured early in life on the other side); about six scales between auricular lobules and postoculars; temporal scales keeled, immucronate, larger than scales between ear and lateral nuchal fold, smaller than largest auricular lobule; scales between ear and lateral nuchal fold keeled, mucronate; a series of keeled, mucronate scales passing from near upper edge of nuchal fold to below middle of ear.

Dorsal scales not reduced in size on nape, weakly keeled, weakly mucronate, their free edges nearly straight, not rounded; lateral scales about one-third smaller than dorsals, not abruptly differentiated from them, more strongly keeled and mucronate than dorsals; all ventral scales except some on midventral line with a single apical notch; scales in axilla and groin imbricated, notched; scales on chest slightly larger than midventral scales; preanal scales somewhat smaller than lateral abdominal scales, subequal in size to smallest midventral scales; dorsal scales on rump somewhat reduced; dorsal caudal scales at least twice as large as scales on rump.

Dorsal scales of upper foreleg keeled, mucronate, subequal in size to dorsal scales on body, slightly larger than largest dorsals on lower foreleg; scales on ventral surface of upper foreleg very small, notched, smooth, those of lower foreleg somewhat larger, weakly keeled, weakly mucronate; lamellar formula for fingers 8–13–18–18–12 (8–12–17–17–11).

Dorsal scales of shank subequal to median dorsals those of thigh slightly smaller; scales on anterodorsal surface of shank near tibiometatarsal joint greatly reduced in size; ventral scales of shank notched, smooth, smaller than dorsal scales of same member; scales on anterior surface of thigh smooth, notched, somewhat smaller than dorsal scales of same member, decreasing in size on ventral surface near femoral pores; scales preceding femoral pores subequal to preanal scales; median scales on posterior surface of thigh keeled, mucronate, subequal to scales in preanal region, decreasing toward series of femoral pores; no postfemoral dermal pocket; enlarged postanals present, broader than long, separated narrowly by two small scales; lamellar formula for toes 8–13–18–19–14 (8–11–16–20–14).

Color.—Dorsal surface olive-gray or brown-gray; a narrow light line from upper posterior margin of orbit along sides of body to rump, its medial edge not well defined, the lateral edge distinct; area between these lines without marks; below the lateral light line a broad, broken, clove-brown band, bordered below by a narrow light band from axilla to groin; below this, irregular scattered spots of clove-brown, absent toward ventral surface; a narrow white line through ear near upper edge, from upper labial region to upper margin of insertion of foreleg, bordered below on neck by a broad clove-brown band passing through lateral nuchal fold and becoming intense black on shoulder; limbs with narrow clove-brown bands; posterior surface of thigh irregularly reticulated with clove-brown.

Males with throat blue, spotted or with narrow convergent lines of white; chest, middle of belly, and ventral surfaces of limbs whitish in young males, with a bluish suffusion in large males; sides of abdomen cyanine blue, bordered medially by a narrow line of black; groin black; base of tail and a narrow line down the middle of the ventral surface of the tail whitish, usually with a bluish suffusion.

Females occasionally uniform white or cream below, usually with a suffusion of blue over entire ventral surface, darker on throat, which has small white spots or narrow white bands. Dorsal surfaces as in the males, except a narrow dark line down each side of back.

Variation.—The variation in scutellation of the head has been examined in 21 specimens. Parietal single, with one to four, usually two, scales behind it; frontoparietals one or two (1, thirty-six; 2, four); frontoparietals in contact medially in none, separated by an azygous scale in two; frontal in contact with interparietals in 17; superciliaries six or seven (6, twenty-six; 7, four); supraoculars four to seven (4, six; 5, twenty; 6, eleven; 7, two); two supraoculars contact median head scales on one side in one; prefrontals in contact in 11, separated by an azygous scale in two; median frontonasal in contact with frontal in eight; nasal contacts rostral in one; internasals usually two pairs; two canthals in two, the second in contact with subnasal on one side in one; preocular divided on one side in one, on both sides in one; two loreals on one side in one; three postrostrals in one, four in others; two complete rows of lorilabials below subocular on one side in four, on both sides in one.

Dorsal scales 44 to 56, average 49.6 (20 counts: 44, one; 45, two; 46, one; 47, two; 48, two; 49, two; 50, three; 51, one; 52, one; 53, two; 55, two; 56, one); ventral scales 48 to 57, average 51.4 (19 counts: 48, three; 49, three; 50, three; 51, one; 52, two; 53, three; 54,

one; 55, one; 56, one; 57, one); scales around body 45 to 53, average 49.1 (19 counts: 45, one; 46, one; 47, four; 48, four; 50, three; 51, three; 52, one; 53, two). Femoral pores 13 to 20, average 16.6 (13, two; 14, three; 15, two; 16, nine; 17, thirteen; 18, six; 19, one; 20, two). Scales between femoral pore series two to five, average 3.5 (2, two; 3, five; 4, seven; 5, one).

Comparisons.—The only species of *Sceloporus* to which *pictus* is closely related is *megalepidurus*, from which it differs by possessing fewer scales from occiput to base of tail (44 to 56 in *pictus*, 54 to 62 in *megalepidurus*); average of femoral pores greater (13 to 20, av. 16.6, in *pictus;* 13 to 18, av. 15.6 in *megalepidurus*); scales between series of femoral pores average fewer (two to five in *pictus*, four to eight in *megalepidurus*); basal subcaudals more strongly keeled (strongly keeled in females of *pictus*, smooth except near distal end of tail in *megalepidurus*); dorsal caudal scales proportionately larger; dorsal scales of shank smaller (subequal in size to median dorsal scales in *pictus*, larger in *megalepidurus*); fewer frontoparietals (usually one on each side in *pictus*, usually two or more in *megalepidurus*); no markings on the back in males (a double series of dark spots down the back in *megalepidurus*); males with distinct blue areas on sides of belly (uniformly whitish or with a general suffusion of pale blue in *megalepidurus*).

Habits and habitat.—Taylor has observed the species in Puebla and Vera Cruz, and states that it is confined to maguey plants. The individuals are extremely wary and difficult to extract from the thorny plants. Apparently semiarid localities are preferred.

Locality records.—Vera Cruz: Acultzingo (EHT 7623, 7629A). Puebla: near Alseseca (EHT 7620A, 7620–2); 20 km. N of Tehuacán (EHT 7624–5, 7625A, 7626–9); Tehuacán (AMNH 42140–1); Santa Catarina (AMNH 18744–5, 18748–9, 18510–1, 18513, 18518); (?)Putla (Boulenger, 1885).

Sceloporus megalepidurus Smith.

Sceloporus microlepidotus Blatchley, Proc. U. S. Nat. Mus., **16**, p. 41, 1893 (part).

Sceloporus megalepidurus Smith, Trans. Kans. Acad. Sci., **37**, pp. 272, 274–277, pl. 9, figs. 7, 8, pl. 10, fig. 13, 1934; idem, Herpetologica, **1**, p. 4, 1936.

Type locality.—Totalco, Vera Cruz. Type EHT 7543, collected by E. H. Taylor and H. M. Smith.

Distribution.—Western Vera Cruz and northern Puebla (fig. 19).

Diagnosis.—A small *Sceloporus*, maximum snout-vent measurement about 55 mm.; head shields smooth; dorsal scales 54 to 62,

average 57.5; lateral scales in oblique rows converging dorsally; scales around body 48 to 57, average 52.7; femoral pores 13 to 18, average 15.6, the two series separated medially by four to eight scales, average 6.2; one canthal; frontoparietals usually divided; generally three auricular lobules, the upper largest; subcaudals smooth except toward tip of tail; preanal scales smooth; ventral abdominal scales somewhat smaller than dorsal scales on body; dorsal scales of shank usually larger than dorsal scales on body; no

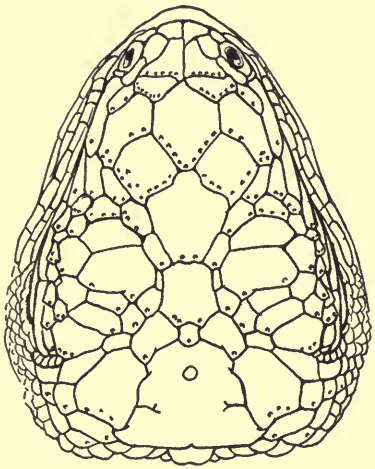

FIG. 20. Head scales of *Sceloporus megalepidurus*.

postfemoral dermal pocket. Dorsal ground color seal brown; a dorsolateral light line, bordered below by a darker band, which in turn is edged below by a light band; a series of small dark spots on each side of middle of back, each spot bordered posteriorly by a larger light spot (invisible in specimens in which scales are shed); males and females immaculate below.

Description.—Cephalic scales smooth; dorsal scales on head, sides of neck and labial region pitted about edges; interparietal very large, about three or four times as large as either parietal; parietal followed posteriorly by one to four small scales, usually two; one to three frontoparietals, usually two, on each side; frontal transversely divided, rarely with additional divisions; frontal usually in contact with interparietal, frequently separated by contact of frontoparietals; supraoculars four to six, usually five; a row of small scales separating supraoculars from median head scales, rarely incomplete; supraoculars divided, the outer sections smaller than inner; one

complete and another incomplete row of small scales between supraoculars and superciliaries; latter usually six, sometimes seven, five generally visible from above; prefrontals usually in contact; commonly two pairs of internasals, occasionally three pairs, or one or two pairs followed by three scales, or, rarely, irregular; four postrostrals; one canthal; one loreal; subnasal subequal in size to canthal; preocular rarely divided; the lorilabials usually reduced to one row below subocular by contact of one scale with subocular and supralabials; two postoculars; three and one-half or four supralabials and five or six infralabials to a point below middle of eye.

Mental pentagonal, broader than long, with a labial border about two-thirds that of rostral; about four pairs of postmentals, the scales of the anterior pair in contact medially; outer row of labiomentals separated from mental by partial contact of first postmental and first infralabial; median and posterior gular scales notched; largest, gular scales near angle of jaws.

Auricular lobules three, smooth, rounded or weakly pointed, the upper the largest and extending usually almost completely across tympanum; temporal scales weakly keeled, not mucronate except near ear, the largest subequal in size to or somewhat smaller than scales between ear and lateral nuchal pocket; latter scales nearly or quite as large as dorsal body scales, strongly keeled and mucronate; a weak fold passing from near middle of lateral nuchal fold to lower edge of ear, surmounted by scales more strongly keeled and mucronate than those surrounding; scales between arm and nuchal pocket variable in size, the upper and lower ones somewhat smaller than dorsal body scales, the median ones much smaller.

Dorsal scales keeled, mucronate, sometimes weakly denticulate, in parallel or slightly convergent rows; lateral scales more strongly keeled, mucronate and denticulate than dorsal scales, the upper lateral scales slightly larger than dorsals, the median laterals slightly smaller; ventral scales slightly smaller than median lateral scales, smooth, notched; preanal scales smaller than ventral abdominals.

Dorsal scales of foreleg of about equal size and about size of dorsals, keeled, mucronate, denticulate; ventral scales of lower foreleg somewhat smaller than dorsal scales of same member, the anteroventral scales smooth, the posteroventral scales keeled; scales on ventral surface of upper foreleg smooth, notched, about one-third or one-fourth size of ventrals on lower foreleg; lamellar formula for fingers 8–14–17–18–11 (8–13–16–17–11).

Dorsal scales on thigh and shank strongly keeled, tridentate, somewhat larger than those on body, those on tibia largest; scales on anterior and ventral surfaces of thigh smooth, the ventral scales about one-half or one-third size of anterior scales; scales immediately preceding femoral pore series subequal in size to preanal scales; scales on posterior surface of thigh keeled, weakly mucronate, slightly smaller than preanal scales; ventral scales on shank smooth, notched or denticulate, subequal in size to or somewhat larger than dorsal scales of same member; lamellar formula for toes 9–13–17–20–14 (9–12–18–20–14).

Dorsal caudal scales one and one-half to two times as large as dorsal body scales, strongly keeled, mucronate, weakly denticulate; subcaudals smooth and notched at base of tail, becoming keeled, mucronate and denticulate distally; females with the subcaudals keeled nearer base of tail; enlarged postanals present and distinct in males; no postfemoral dermal pocket.

Color.—Approximately seal brown above; a dorsolateral light line extending from posterior corner of eye to base of tail, its inner border indistinct, the outer border distinct; between these lines, a series of 12 or 13 small black spots in a series on each side of median dorsal line, each spot usually bordered posteriorly by an indefinitely outlined small light spot; a clove-brown dark band below dorsolateral light line, the band darkest on sides of neck, frequently split longitudinally on sides of body by an indistinct lighter line; a light line passing through labial region, through upper edge of ear to a point above arm, there uniting with a vertical line passing from insertion of foreleg to the dorsolateral light line; a light line below lateral dark band on sides of body between axilla and groin, bordered below by a clove-brown band becoming lighter toward venter; limbs with distinct dark narrow bars; tail with numerous narrow alternating dark and light bands.

Venter white or, more frequently, suffused with blue; a few, small light spots on throat.

Variation.—The variation of cephalic scutellation of 50 specimens has been recorded. Parietal single, with one to four, usually two, scales behind it; frontoparietals one to three on each side (1, thirty-two; 2, sixty-four; 3, four); frontoparietals in contact medially in 17, separated by an azygous scale in eight; frontal touches interparietal in 25; anterior section of frontal longitudinally divided in three, divided transversely in two, divided into three scales in two; posterior section of frontal transversely divided in one; superciliaries five to

seven (5, four; 6, ninety-one; 7, five); supraoculars four to six (4, eight; 5, seventy-nine; 6, thirteen); supraoculars partially in contact with median head scales in eight specimens; prefrontals in contact medially in 30, separated by an azygous scale in 10; median frontonasal in contact with frontal in 10; usually two pairs of internasals; canthals one–one in all (94 specimens examined); preocular divided on one side in four, on both sides in six; two loreals on one side in one; three postrostrals in one, five in two, six in one (four in others); lorilabials reduced to one row below subocular by a scale in contact with both subocular and supralabials on one side in seven, on both sides in 39.

Dorsal scales 54 to 62, average 57.5 (50 counts: 54, three; 55, four; 56, ten; 57, eleven; 58, four; 59, nine; 60, five; 61, three; 62, one); ventral scales 48 to 57, average 52.7 (50 counts: 48, two; 49, three; 50, five; 51, four; 52, eleven; 53, four; 54, eight; 55, seven; 56, four; 57, two); scales around body 49 to 58, average 53 (50 counts: 49, five; 50, three; 51, three; 52, seven; 53, eleven; 54, eleven; 55, two; 56, six; 57, one; 58, one). Femoral pores 13 to 18, average 15.6 (100 counts: 13, two; 14, eleven; 15, thirty; 16, forty; 17, fourteen; 18, three). Scales between series of femoral pores 4 to 8, average 6.2 (50 counts: 4, three; 5, seven; 6, nineteen; 7, eighteen; 8, three).

Comparisons.—The species is compared with *pictus*, its closest relative, in the discussion of the latter. Two species, described by Cope (*heterurus*) and Baird and Girard (*dispar*), require discrimination. *S. heterurus* cannot be *megalepidurus*, since Cope (1866, p. 322) states that the type measures 2.5 inches snout to vent; the largest specimen examined of *megalepidurus* measures two and one-eighth inches snout to vent; he further states that there are "numerous delicate brown lines, directed obliquely forward toward the back and there turning backwards"—a pattern found in neither *megalepidurus* nor *pictus*.

S. dispar Baird and Girard (1854, p. 127) cannot be involved, as the male is stated to have the sides of the belly blue (eliminating *megalepidurus*); the "scales of the abdomen are likewise a little larger than those on the back"; in *pictus* the ventral abdominal scales are about one-half the size of the dorsal body scales.

Habits and habitat.—These lizards have been collected in the rather high, semiarid regions near the eastern edge of the Mexican plateau. They were largely confined to the ground on hills and lava beds, apparently not living on the plains. They were frequently

found under fallen yuccas. Most were caught by hand. Blatchley collected specimens at altitudes as high as 10,000 feet on Mount Orizaba.

Locality records.—PUEBLA: Volcán Orizaba (FMNH 1518[3]); Tepeyahualco (EHT 7500–10); 15 mi. E of San Marcos (EHT 7511–41). VERA CRUZ: Totalco (EHT 7542–62, 7565–7610); Mt. Orizaba (MCZ 14157).

THE POINSETTII GROUP

Twenty species and subspecies allied to *poinsettii* have been described. Of these I recognize eighteen as valid.

Distributional data indicate that the group is very definitely of Mexican origin. It is found in the United States only along the Mexican border, and in Central America only in the Petén region of Guatemala.

Species of the group are as a rule confined to rocky habitats. So far as I am aware, only *cyanogenys* tends to live on or near the ground. *S. jarrovii* and *serrifer* are found on trees, *jarrovii* occasion-

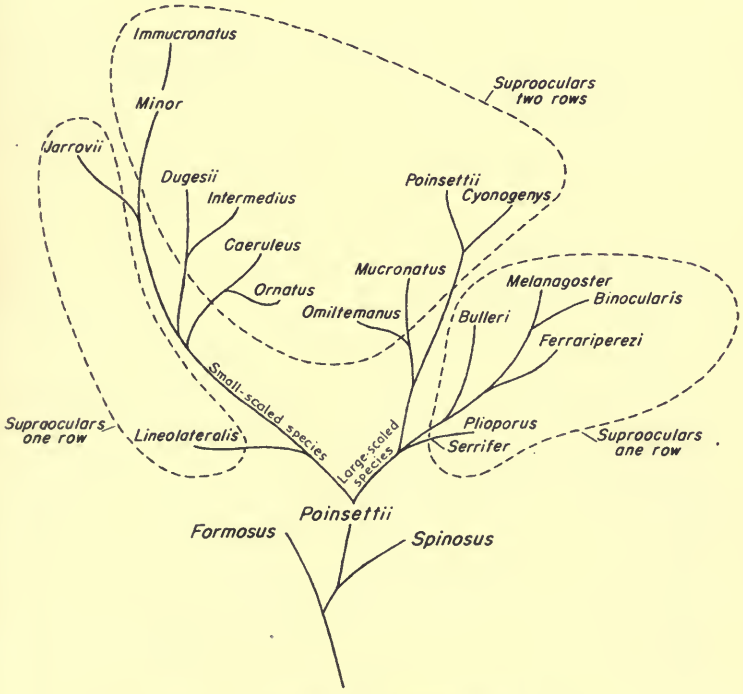

FIG. 21. Phylogeny of the *poinsettii* group.

ally and *serrifer* perhaps usually. Individuals of most species are extremely wary and difficult to collect. In central Mexico a number of species are found in great abundance on rock fences.

Full descriptions, synonymies, and lists of specimens of all forms of the group (save two, subsequently described) may be found in the Kansas University Science Bulletin, **21**, pp. 539–693. Additional locality records are included here.

KEY TO THE SPECIES AND SUBSPECIES OF THE POINSETTII GROUP

1.—Supraoculars in a single series, with no scale divided....2
Supraoculars in two series; or, if in one series, with one or more scales divided 9

2.—Femoral pores 8 to 14; dorsal scales 25 to 35....3
Femoral pores more than 14; or dorsal scales more than 35....5

3.—Dorsal nuchal collar broadly interrupted medially by a space about five scales wide; throat mottled....*ferrariperezi binocularis* (p. 216)
Dorsal nuchal collar broad, complete; throat not mottled....4

4.—Femoral pore counts on both sides usually total more than 21; dorsal scales usually 31 or more....*serrifer plioporus* (p. 212)
Femoral pore counts on both sides usually total less than 22; dorsal scales generally less than 31....*serrifer serrifer* (p. 212)

5.—Dorsal scales 31 or less....6
Dorsal scales more than 31....7

6.—Nuchal collar divided on each side of neck, the area between lighter in color; dorsal color light, with dark and light spots irregularly placed; size large (maximum snout-vent measurement 129 mm.); dorsal scales more strongly keeled and mucronate....*ferrariperezi melanogaster* (p. 216)
Nuchal collar broad, complete; dorsal color dark, without light spots; maximum snout-vent measurement 98 mm.; dorsal scales more weakly keeled and mucronate....*ferrariperezi ferrariperezi* (p. 214)

7.—Lateral scales about one-half as large as median dorsals.
lineolateralis (p. 225)
Lateral scales as large as or larger than dorsals....8

8.—Dorsal scales 40 or more; nuchal collar narrow, with light borders broken; a light line on side of head and another on side of neck; each dorsal scale usually with a light median spot....*jarrovii jarrovii* (p. 226)
Dorsal scales usually less than 40; nuchal collar broad, with unbroken light borders; no light lines on sides of head and neck; no spots on dorsal scales.
bulleri (p. 218)

9.—Lateral scales with the terminal point arising well within the free posterior margin; dorsal scales 41 or more....10
Lateral scales with the terminal point arising at or very near the free posterior margin; head scales not microscopically rugose; no oblique dark blue lines on throat....11

10.—Dorsal scales 47 to 54; throat with very distinct, oblique, dark blue lines; head scales not microscopically rugose; oblique dark bands on sides of body distinct; maximum snout-vent measurement 79 mm.
dugesii intermedius (p. 235)
Dorsal scales 41 to 50; throat without or with very faint oblique lines; head scales microscopically rugose; oblique dark bands on sides of body indistinct or absent; maximum snout-vent measurement 87.5 mm.; femoral pores not over 13....*dugesii dugesii* (p. 234)

11.—Dorsal scales 55 or more....*ornatus ornatus* (p. 231)
Dorsal scales less than 55....12

12.—Dorsal scales 47 to 53.....*ornatus caeruleus* (p. 232)
Dorsal scales less than 47.....13

13.—Black nuchal collar six to eight scales broad; supraoculars usually in two complete rows; irregular dark markings frequently present on throat; dorsals 34 to 46; series of dorsal scales never with longitudinal light and dark lines; maximum snout-vent measurement 101 mm.
jarrovii minor (p. 229)
Black nuchal collar less than six scales broad.....14

14.—Nuchal collar two or three scales broad; general ground color blue, at least in males; males with the entire belly black and blue; dorsal scales 37 to 46; maximum snout-vent measurement 87 mm. *jarrovii immucronatus* (p. 230)
Nuchal collar more than two or three scales broad; maximum snout-vent measurement 100 mm.....15

15.—Tail with very distinct, broad, alternating dark and light bands, most distinct toward tip, where they are complete; supraoculars in two complete rows; head scales very irregular; light borders of nuchal collar broad; a broad light band across neck behind occiput; preocular usually entire; inner row of labiomental scales generally terminating at a point posterior to suture between second and third infralabials.....*poinsettii* (p. 209)
Tail without distinct alternating dark and light bands of nearly equal width; bands about tail not complete toward tip; dorsal scales 40 or less.....16

16.—Dorsal scales 31 or less; two parallel, dark lines down middle of throat (except in adult males); a broad, median, dark band usually visible, composed of about five large dim blotches.....*mucronatus mucronatus* (p. 218)
Dorsal scales more than 31; or, if less, without parallel lines down middle of throat; without a median dark band.....17

17.—Light borders of nuchal collar usually unbroken medially; upper auricular lobule much enlarged; each dorsal scale row usually with a longitudinal light line; general dorsal coloration dark; maximum snout-vent measurement 114 mm.....*mucronatus omiltemanus* (p. 220)
Light borders of nuchal collar usually broken medially; auricular lobules not well differentiated; no lines on dorsal scale rows; general dorsal coloration very light, usually bluish; maximum snout-vent measurement 143 mm.
cyanogenys (p. 221)

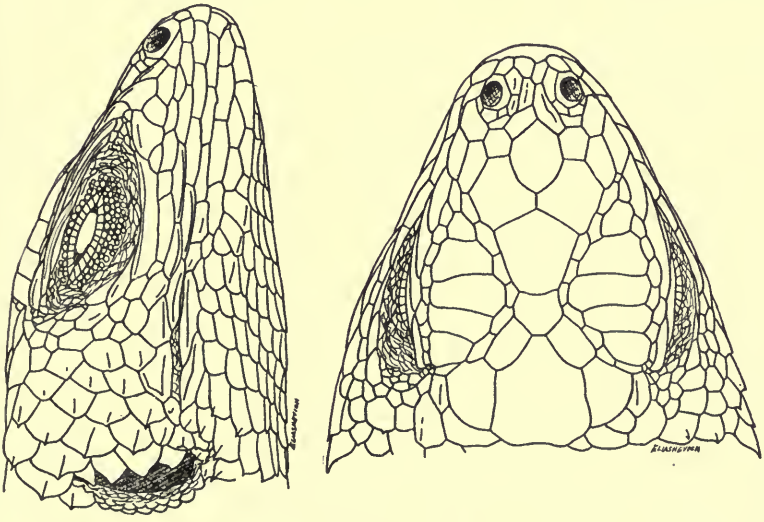

FIG. 22. Head scales of *Sceloporus serrifer serrifer*.

Sceloporus serrifer serrifer Cope.

Sceloporus serrifer Cope, Proc. Acad. Nat. Sci. Phila., 1866, p. 124, 1866.

Type locality.—Yucatan. Type USNM 24868; apparently seven paratypes, USNM 10298, 24869–74; all collected by Arthur Schott.

Distribution.—Northern part of the Yucatan Peninsula (fig. 23).

Diagnosis.—Dorsal scales 28 to 32 from occiput to base of tail, average 30; femoral pores 8 to 12, average 9.8; supraoculars in a single row, entire, the last occasionally in partial contact with median head scales; tibia about equal to length of shielded part of head; length of fourth toe usually greater than snout-ear measurement; general dorsal coloration light; nuchal collar complete, light-bordered; parietals, interparietal, and posterior part of frontal each with a conspicuous light spot; several light spots or bands on neck; each dorsal scale with a black median streak along the keels in females; throat bluish, reticulated or spotted with white or cream; middle of belly and usually the chest cream or white in males.

Sceloporus serrifer plioporus subsp. nov.

Type.—Four miles east of Encero, Vera Cruz. No. 32004 Field Museum of Natural History. Male. Collected by E. H. Taylor. Paratypes 13; two topotypes (EHT 9416–7); five miles east of Jalapa, Vera Cruz (EHT 9409–15); and Las Vigas, Vera Cruz (EHT 9405–8).

Distribution.—Gulf coast of Mexico from southern Tamaulipas southward to the basal part of the Yucatan Peninsula and to the Guatemalan Department of Petén (fig. 23).

Diagnosis.—Similar to *serrifer serrifer*, differing in average femoral pore count, the count on each thigh 9 to 14, average 11.9 (on both thighs, 20 to 27, average 23.8); dorsal scales smaller, average 31.7.

Comparisons.—In *serrifer plioporus* the femoral pores vary between nine and 14 (68 counts: 9, one; 10, four; 11, eighteen; 12, twenty-eight, 13, twelve; 14, five). The counts on both sides in 32 specimens vary between 20 and 27 (20, one; 21, three; 22, four; 23, eight; 24, five; 25, eight; 26, one; 27, four). In *serrifer serrifer* the pore counts vary between eight and 12, average 9.8 (164 counts: 8, ten; 9, fifty; 10, sixty-nine; 11, thirty-two; 12, three). The counts on both sides in 81 specimens vary between 16 and 23, average 19.6 (16, three; 17, three; 18, fifteen; 19, sixteen; 20, nineteen; 21, sixteen; 22, eight; 23, one). In *serrifer plioporus*, 92.6 per cent of the femoral pore counts (one side) are 11 or more; in *s. serrifer*, 21.3 per cent are

11 or more. In *s. plioporus*, 88.2 per cent of the counts in each specimen (both sides) are 22 or more; in *s. serrifer*, 11.1 per cent are 22 or more.

The dorsal scales in *s. plioporus* vary between 30 and 35 (30, seven; 31, four; 32, five; 33, five; 34, two; 35, one); in *s. serrifer*, the variation is between 28 and 32, average 30 (28, four; 29, five; 30, six; 31, five; 32, four). In *s. plioporus*, 70.8 per cent of the dorsal scale counts are 31 or more; in *s. serrifer*, 37.5 per cent are 31 or more.

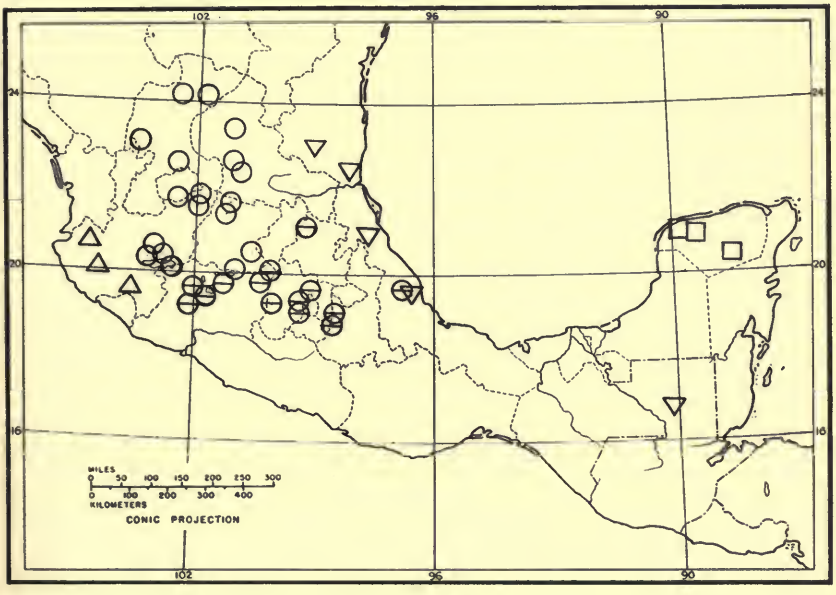

FIG. 23. Distribution of *Sceloporus serrifer serrifer*, □; *S. s. plioporus*, ▽; *S. ferrariperezi ferrariperezi*, ⊖; *S. f. melanogaster*, ○; *S. bulleri*, △.

Specimens from Campeche (Balchacaj) seem to be *s. serrifer;* the femoral pore counts are 10–10 in two specimens, 10–11 in one 11–11 in one, and 11–? in one. A sufficient series is not yet available from Campeche to demonstrate where *s. plioporus* occurs.

A specimen collected 26 kilometers north of Limón, Tamaulipas (EHT 9411) is referred to this subspecies despite a number of differences. There is an outer row of small supraoculars; femoral pores 9–10; head scales very strongly keeled. I suspect that it represents a new subspecies of *serrifer*, but the single specimen may be aberrant. It was collected on a palm tree in the large palm forest of southern Tamaulipas.

Locality records.—TAMAULIPAS: Chocoy (MCZ 17493); 26 km. N of El Limón (EHT 9411). VERA CRUZ: Papantla (USNM 47353); Las Vigas (EHT 9405–8); 5–6 mi. E of Jalapa (EHT 9409–15); 4 mi. E of Encero (EHT 9416–8); 20 mi. S of Mandinga (AMNH 15475).

GUATEMALA: Sotz (UMMZ 74956 [12]); La Primavera, 2,500 feet (MCZ 8153–9).

Sceloporus ferrariperezi ferrariperezi Cope.

Sceloporus ferrariperezi Cope, Proc. Amer. Phil. Soc., **22**, p. 400, 1885 (part).

Sceloporus ferrariperezi ferrariperezi Smith, Kans. Univ. Sci. Bull., **24**, p. 539, 1938.

Type locality.—Guanajuato. Cotypes USNM 9874, 9876, 9878, 9880, 9895 (9877 is *spinosus spinosus*).

Distribution.—Central Mexico, including Hidalgo, west central Vera Cruz, Mexico, Distrito Federal, northern Puebla, eastern Morelos, southern Guanajuato, and northern Michoacán (fig. 23).

Description.—Head scales smooth; supraoculars in a single row, rarely (5 per cent) with the outer one-third or one-fourth of two or three separated off; two to three incomplete rows of scales separating the supraoculars from the superciliaries; one row of elongate to squarish scales between supraoculars, the first supraocular rarely touching narrowly the median head scales (2 per cent); frontal normally contacting interparietal (91 per cent); canthals normally two (96 per cent), the first frequently (60 per cent) above the canthus, the second canthal and subnasal contacting; median frontonasal usually (66 per cent) in contact with the frontal, or separated from it by a small median scale between the two prefrontals; the lateral series of scales intercalated between the series of postmentals and the infralabials frequently (about 45 per cent) touching the mental anteriorly; lobules on anterior margin of ear usually larger than those preceding, generally three in number, the upper two largest; median dorsal scales 26 to 30 from occiput to base of tail, in parallel series, smooth or weakly keeled, rounded or weakly mucronate; lateral dorsals somewhat larger than median dorsals, more strongly keeled and mucronate; femoral pores 14 to 23 (average 18) on each side, the two series closely approximated medially; tibia approximately equal to length of shielded part of head; length of fourth toe usually a little less than distance from snout to posterior margin of ear, rarely slightly more.

Black nuchal collar always present, four or five scales long on the mid-dorsal line; light borders of black collar one scale wide; posterior

light border frequently narrowly interrupted medially, extending laterally onto the proximal end of the humerus; anterior light border usually interrupted medially, extending laterally a variable distance, sometimes to the posterior border of the ear, passing along the crest of the lateral nuchal fold, sometimes terminating at a point dorsal and anterior to the insertion of the foreleg; this border sometimes horseshoe-shaped, and extending anteriorly on each side to a point above the ear, becoming quite faint anteriorly; light borders variable in color, sometimes cream, sometimes blue or green, occasionally strongly tinged with orange; a few irregular light spots frequently present on neck; upper labial region occasionally faintly barred; back

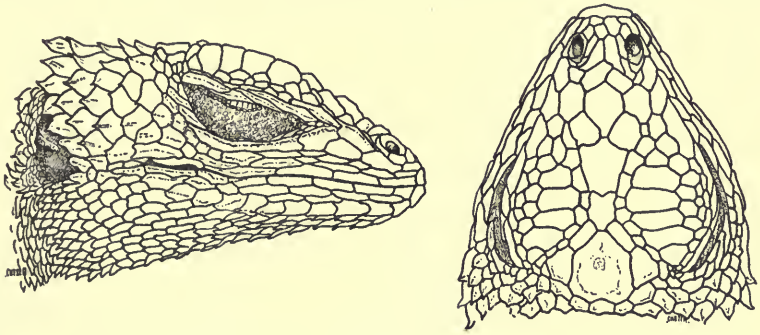

FIG. 24. Head scales of *Sceloporus ferrariperezi ferrariperezi*.

uniform olive-gray, drab, olive or blue-gray, varying according to the time elapsed since the last ecdysis; spots on back present only in some very young specimens, and, when present, large and indistinct; anteroventral surface of femur usually coarsely reticulated; dorsal surface of limbs rarely banded, light bands faint and narrow when present, bluish in color; posterior surface of femur usually traversed by a light band, usually rather dim; tail with numerous narrow indistinct light bands, bluish or cream in color.

Ventral gular and chin region irregularly spotted or reticulated, all light areas disappearing and replaced by black or blue in adult males; no longitudinal pair of dark lines near the midventral line on the throat ever present. In some adult males, the entire ventral surface of head, body, and tail is black, with the exception of cream-colored areas on the tail and femur. In other large males the throat is pale iridescent blue, becoming azure blue toward the neck; the neck is black, and this color is continuous with a broad median ventral black band, occupying the chest, a wide area in the middle of the abdomen, and the groin. Usually some pale blue or cream-

colored areas are visible in the middle of the abdomen. The sides of the belly are azure blue, with a generous tinge of campanula blue.

In females the belly may become drab-gray, usually darker toward the sides, and the throat usually remains gray-blue with numerous white flecks or reticulations.

Locality records.—MEXICO: El Tajo de Tequixquiac (MVZ 8850); Amecameca (WM 4); San Juán Teotihuacán (CAS 54635–6); 55 mi. N of Mexico City (EHT 9079, 9087). DISTRITO FEDERAL: 20 mi. N of Mexico City (EHT 9080–6, 9088–9101); lava field near Tlalpam (EHT 9116–8); Mexico City (CAS 73459–69). MORELOS: Cempoala (EHT 9114–5); 8–12 mi. N of Cuernavaca (EHT 9102–13). HIDALGO: Durango (WM 1; EHT 9119); Minas Viejas (EHT 9061–78). MICHOACÁN: Uruapan (EHT 9120–32). GUANAJUATO: (LSJU 3844).

Sceloporus ferrariperezi melanogaster Cope.

Sceloporus melanogaster Cope, Proc. Amer. Phil. Soc., **22**, pp. 400–401, 1885.

Sceloporus ferrariperezi melanogaster Smith, Kans. Univ. Sci. Bull., **24**, p. 539, 1938.

Type locality.—Mexico, Noría (Michoacán), or Tupátaro, near Cueramaro (Michoacán). Type USNM 9877, collected by Dugès.

Distribution.—Northern Jalisco, west through all of Guanajuato, except the extreme southern part, north through central and southern San Luis Potosí and Zacatecas (fig. 23).

Diagnosis.—Maximum size 129 mm.; scutellation similar to that of *f. ferrariperezi;* nuchal collar interrupted medially; a light band one scale row wide extending from upper edge of ear posteriorly to a point above insertion of foreleg.

Sceloporus ferrariperezi binocularis Dunn.

Sceloporus binocularis Dunn, Proc. Acad. Nat. Sci. Phila., **88**, pp. 474–475, 1936.

Type locality.—Trail from Pablillo to Alamar, Nuevo León. Type ANSP 20032.

Distribution.—Known only from the type locality.

Diagnosis.—Similar to *ferrariperezi melanogaster*, differing in femoral pore count and in certain features of coloration; five large supraoculars, separated from superciliaries by one row of scales; dorsal scales 25 to 28; femoral pores 11 to 13; dorsal scales keeled, weakly mucronate, weakly denticulate; lateral scales three-fourths size of dorsals, not denticulate; ventral scales notched, one-half size of dorsal scales; scales on posterior surfaces of thigh large, the

largest larger than preanal scales. Throat mottled with white and pale greenish blue; nuchal collar broken medially by a space five scales wide, the center of which is occupied by a black-outlined, flask-shaped mark; a row of about five dark spots, each about the size of a scale, on either side of mid-dorsal line; toes and fingers barred; tail very faintly barred.

Variation.—Only the type and two paratypes are known. There is one parietal on one side in one, two in the others; frontal touches interparietal in one, separated by contact of frontoparietals in one;

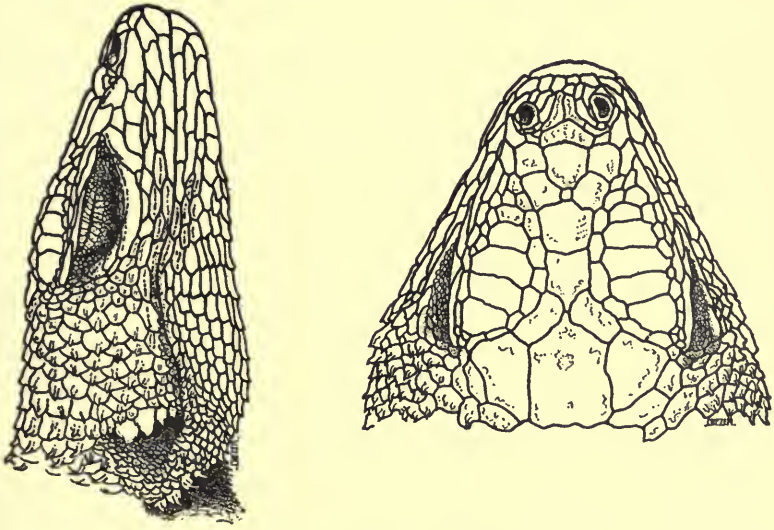

FIG. 25. Head scales of *Sceloporus bulleri.*

anterior section of frontal longitudinally divided in one; six superciliaries and five supraoculars in all three; prefrontals in contact; frontonasals normal; nasal separated from rostral; internasals irregular; two canthals, normal (first in contact with lorilabials on one side in one); one loreal; three postrostrals in one, four in others; lorilabials reduced to one row below subocular by contact of a scale with both subocular and supralabials on one side in two.

Dorsal scales 25 to 28 (25, 27, 28); ventral scales 34 to 40 (34, 38, 40); scales around body 29 to 32 (29, 32, 32); femoral pores 11 to 13 (11, one; 12, four; 13, one).

The types appear to be immature; the two paratypes measure 45 (female) and 42.5 (male) from snout to vent. The measurements and scale counts of the type (female) are: snout to vent 56.3; tail

94.3 snout to occiput 10.9; snout to ear 14.3; hind leg 39.8; tibia 11.6; fourth toe 16.2; fifth toe 8.4; lamellae fourth toe 20–20; femoral pores 11–13; dorsal scales 27; ventrals 38; scales around body 32; scales to head length 5.4.

Sceloporus bulleri Boulenger.

Sceloporus bulleri Boulenger, Proc. Zool. Soc. Lond., **1894**, pp. 729–730, pl. 48, fig. 3, 1894.

Type locality.—La Cumbre de los Arrastrados, Jalisco.

Distribution.—Western and southern parts of Jalisco (fig. 23).

Diagnosis.—Supraoculars large, in a single row; femoral pores 14 to 19; dorsal scales 33 to 41; fourth toe slightly less than snout-ear measurement; tibia slightly shorter than snout-occiput measurement; nuchal collar three or four scales wide, uninterrupted, with light anterior and posterior borders about one scale wide, uninterrupted; nuchal collar complete about neck in males; sides of belly in males dark blue, black-edged.

Sceloporus mucronatus mucronatus Cope.

Sceloporus torquatus mucronatus Cope, Proc. Amer. Phil. Soc., **22**, p. 402, 1885.

Sceloporus mucronatus mucronatus Smith, Kans. Univ. Sci. Bull., **24**, p. 583, 1938.

Type locality.—Mirador, Vera Cruz. Cotypes USNM 25074–9, collected by Sartorius No. 25077 designated as lectotype.

Distribution.—Parts of the states of Hidalgo, Vera Cruz, Puebla, and Mexico (fig. 27).

Diagnosis.—Dorsals 27 to 30 from occiput to base of tail, weakly keeled, weakly mucronate, but with several lateral mucrones; upper

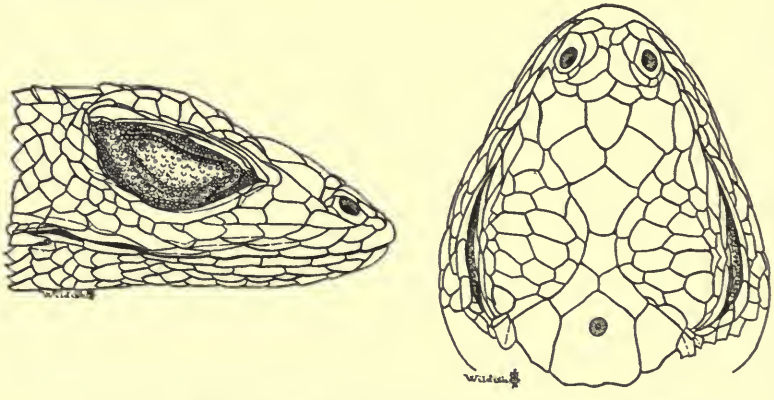

FIG. 26. Head scales of *Sceloporus mucronatus mucronatus*.

lateral scales somewhat larger than median dorsals, more strongly keeled and mucronate; dorsal scales of body somewhat smaller than largest dorsal caudals; median ventrals about one-third or one-fourth as large as dorsals; scales around body 34 to 38; head scales smooth; frontoparietals always in contact medially, or separated by an azygous scale; supraoculars always in two series; canthals irregular, usually two, the first sometimes forced above the canthal ridge, the

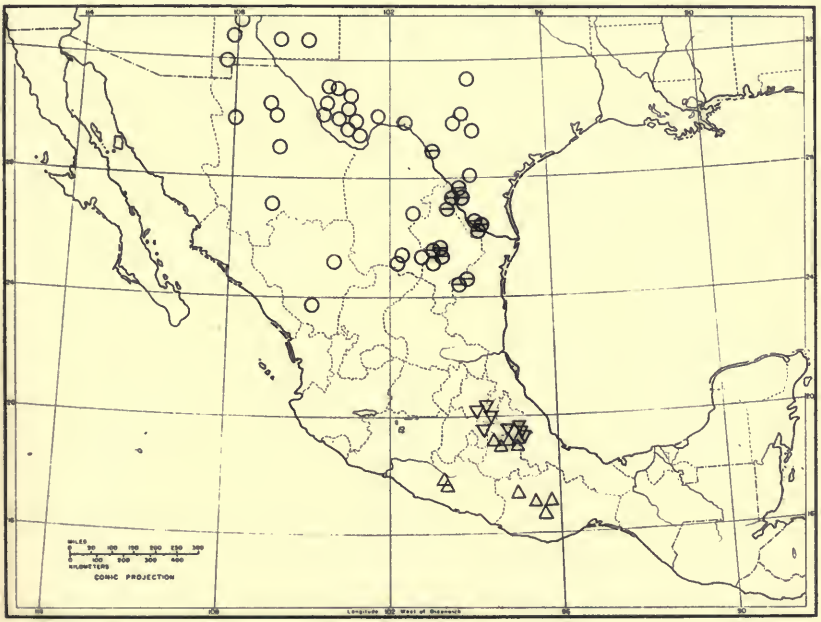

FIG. 27. Distribution of *Sceloporus mucronatus mucronatus*, ▽; *S. m. omiltemanus*, △; *S. cyanogenys*, ○; and *S. poinsettii*, ⊖.

second canthal and subnasal in contact; femoral pores 11–17 on each side, averaging about 13; tibia about as long as shielded part of head; length of fourth toe about equal to distance from snout to posterior margin of ear; a black nuchal collar, about four scales wide, continuous about throat in adult males; collar bordered on each side by a light band one scale wide; the posterior border sometimes continued over upper foreleg near insertion; a broad, median, dark band usually visible, composed of about five large, faint blotches, which are sometimes separated from each other by narrow, somewhat lighter areas; two parallel dark lines, one on either side of the median ventral line, extend from near the chin to the gular fold region; tail faintly banded;

dorsal ground color olive to wood-brown. In adult males, sides of the abdomen and area anterior to gular fold region cerulean or cobalt blue; gular fold region black; area anterior to this becoming darker with age, losing all trace of markings; breast, median abdominal area and region about groin black.

Sceloporus mucronatus omiltemanus Günther.

Sceloporus omiltemanus Günther, Biol. Cent.-Amer., Rept. Batr., p. 66, 1890 (part).

Sceloporus mucronatus omiltemanus Smith, Kans. Univ. Sci. Bull., **24**, p. 591, 1938.

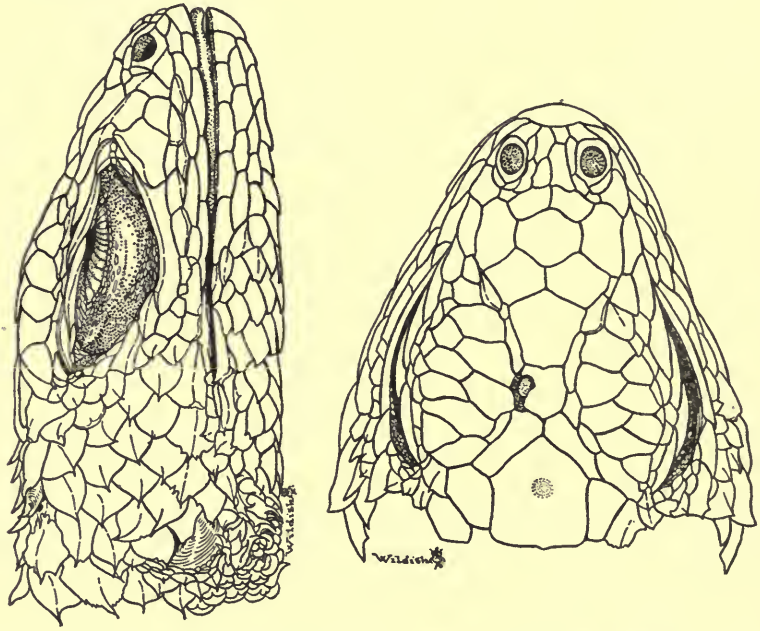

FIG. 28. Head scales of *Sceloporus mucronatus omiltemanus.*

Type locality.—Omilteme, Guerrero. Type in British Museum.

Distribution.—From central Vera Cruz to Oaxaca and Guerrero; south to Chiapas (fig. 27).

Diagnosis.—Head shields smooth; supraoculars in two rows, irregular; frontal rarely contacting interparietal, usually separated by an azygous scale, occasionally by contact of the two frontoparietals; laterals about one-third smaller than dorsals, in oblique series; dorsals weakly keeled, mucronate, in parallel or slightly converging series, usually 30 to 38 from occiput to base of tail, rarely less than 30;

laterals a little more strongly keeled and mucronate than dorsals; upper scale of auricular series extremely large, larger than preceding scales and much larger than other auricular scales; tibia about as long as shielded part of head; fourth toe as long as or slightly longer than distance from snout to posterior margin of ear; hind leg 61 to 70 per cent of snout-vent measurement fourth toe 22 to 26 per cent of snout-vent measurement; black nuchal collar about four scales wide, curving slightly posteriorly, and light-bordered; posterior light border complete, one to two scales wide, extending onto humerus; anterior border similar, but very short, not extending beyond lateral nuchal fold and occasionally interrupted; sides of belly cobalt blue in males, not or only narrowly and indistinctly bordered with black laterally; gular fold region black, continuous with the black of the nuchal collar; area anterior to gular fold region uniform cobalt or azure blue; dorsal caudals slightly larger than dorsals on back.

Remarks.—The specimen from Chiapas (USNM 46861) referred by me (Kans. Univ. Sci. Bull., **24**, p. 561, 1938) to *serrifer* belongs to *m. omiltemanus*.

Locality records.—CHIAPAS: Canjob (USNM 46861). VERA CRUZ: 1–2 mi. W of Acultzingo (EHT 9219–25, 9229–35). PUEBLA: Km. 196, near Alseseca (EHT 9226–8). OAXACO: Tlaxiaco (AMNH 58260, 58262–5). GUERRERO: Omilteme and Sierra de Burro (MCZ 15).

Sceloporus cyanogenys Cope.

Sceloporus torquatus cyanogenys Cope, Proc. Amer. Phil. Soc., **22**, p. 402, 1885.
Sceloporus cyanogenys Smith, Kans. Univ. Sci. Bull., **24**, p. 599, 1938.

Type locality.—Monterrey, Nuevo León. Cotypes USNM 31373–7 and (?) ANSP 11304–5; collected by Cope.

Distribution.—Southern Texas, from Devil's River and Starr County to central Tamaulipas and Nuevo León (fig. 27).

Diagnosis.—Dorsal scales weakly keeled, mucronate, with several lateral denticulations, 32 to 40 from occiput to base of tail; lateral scales in oblique rows, somewhat larger than median dorsals; fourth toe about equal to distance from snout to posterior border of ear; hind leg 59 to 67 per cent of snout-vent measurement; fourth toe 20 to 25 per cent of snout-vent measurement; supraoculars irregular, not in two equal rows, rarely in a single row; median cephalic scales not extremely irregular; preocular rarely divided; inner row of labiomentals rarely terminating posterior to suture between second and third infralabials; rows of lorilabials usually not reduced to one at a point below subocular; femoral pores usually twelve or more

on each side. General ground color greenish-blue (brownish prior to shedding); nuchal black collar four to five scales wide, sometimes continued on ventral surface, bordered anteriorly and posteriorly by a light band one or one and one-half scales wide, both interrupted medially by a dark scale; a light spot in center of interparietal and of each parietal; body without or with faint darker markings; throat and sides of belly in males pearl blue to flax-flower blue or campanula

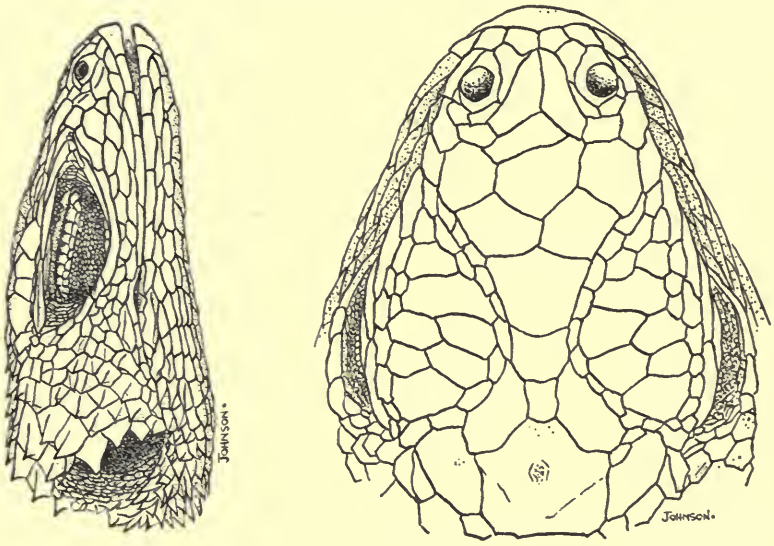

FIG. 29. Head scales of *Sceloporus cyanogenys*.

blue; lateral abdominal blue areas in males with a dark-blue medial border not encroaching on anterior distal surface of femur; throat not barred or rayed.

Remarks.—The additional material recently studied demonstrates two facts which should be emphasized. It has long been the custom to consider *cyanogenys* a subspecies of *ferrariperezi* (*torquatus* auct.); that this is not so is demonstrated by the occurrence of *ferrariperezi binocularis* with *cyanogenys* near Galeana, Nuevo León. At the point of contact of the range of *ferrariperezi* and *cyanogenys*, the two species have become well differentiated both in coloration and in size of dorsal scales. Unless it can be proved that *ferrariperezi* is linked subspecifically through subspecies other than *f. binocularis*, *cyanogenys* should be considered a species.

More evidence for the distinctness of *Sceloporus poinsettii* and *cyanogenys* has been secured by Dr. E. H. Taylor, who collected

both species together in Nuevo León at Cienega de Flores, 30 kilometers south of Monterrey, Huasteca Canyon, 11 miles west of Monterrey, and four miles west of Sabinas Hidalgo. Specimens of both species could be seen from one spot.

Eleven young were borne June 2, 1937, by a female specimen collected by Stanley Mulaik at Arroyo Los Olmos, three miles southeast of Rio Grande City, Starr County, Texas (UMMZ).

Locality records.—NUEVO LEÓN: 4 mi. SW of Nuevo Laredo (MVZ 12700–1); Arroyo Vaquero, between Monterrey and Nuevo Laredo (BYU 3011–5); Pablillo (ANSP 20023); Cieneguillas (ANSP 20008, 20011); 4 mi. SW of Sabinas Hidalgo (EHT 8718–9); Cienega de Flores, 30 km. S of Monterrey (EHT 8720–9); Huasteca Cañon, 11 mi. W of Monterrey (EHT 8730–7).

Sceloporus poinsettii Baird and Girard.

Sceloporus poinsettii Baird and Girard, Proc. Acad. Nat. Sci. Phila., **6**, pp. 126–127, 1852.

Type locality.—Rio San Pedro of the Rio Grande del Norte, and the province of Sonora. Cotypes USNM 2948 (2 specimens) and 2952 (2 specimens); collected by J. H. Clark.

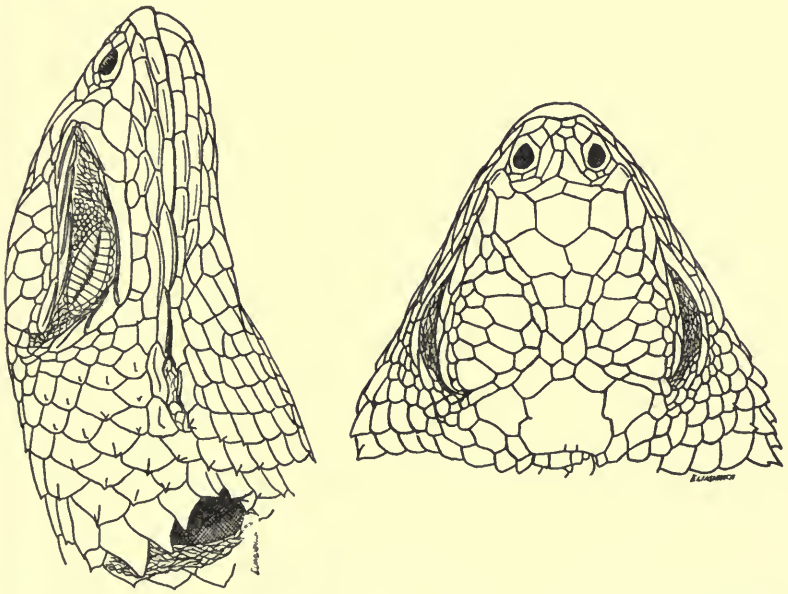

FIG. 30. Head scales of *Sceloporus poinsettii*.

Distribution.—Southern New Mexico, central and western Texas, through western Nuevo León and Coahuila to central Durango (fig. 27).

Diagnosis.—A broad, black nuchal collar two and one-half to three scales broad, uninterrupted medially, with broad, light-colored borders about two scales wide; tail very strongly banded, the dark bands wider than the light bands and extending completely around tail near tip; general color, straw to reddish yellow; back frequently with broad bands; dorsals 31 to 41, average 35.7, nearly smooth, not or but weakly mucronate; supraoculars in two complete rows; median cephalic scales usually very irregular; the anterior frontal usually divided; preocular rarely divided; inner row of labiomentals rarely terminating anterior to suture between second and third infralabials; lorilabials usually reduced to one row at some point below subocular; femoral pores usually not over 12; maximum snout-vent measurement about 120.

Locality records.—TEXAS: (ANSP 12424, 12426–7, 19692). BEXAR CO.: Helotes (ANSP 12425, 12428–33). BREWSTER CO.: (UMMZ 66092–141); Big Bend State Park, Marathon (MVZ 18969); Chilicotal Mts. (MCZ 31740); Boot Spring, Chisos Mts. (UMMZ 72075–6); Juniper Canyon, Chisos Mts. (MCZ 31742); Emery Peak, Chisos Mts. (UMMZ 69868[3]); Glen Springs (MCZ 31743); 4 mi. N of Glen Springs (MCZ 31741); Burnham Ranch, Chisos Mts. (UMMZ 69867[2]); Chisos Mts. (MCZ 29013–5; USNM 32961). CULBERSON CO.: Frijole, S end of Guadelupe Mts. (UMMZ 70084[4]); Guadelupe Canyon (UMMZ 70085); Guadelupe Mts. (USNM 32962). EL PASO CO.: Hueco Tanks (UMMZ 71127[6]). JEFF DAVIS CO.: Limpia Canyon, Davis Mts. (UMMZ 69864–6); Fort Davis (MCZ 31746–7); Cherry Valley (MCZ 31744; UMMZ 51411, 49834–6, 55725–30); Davis Mts. (USNM 32964–5; ANSP 16854–5; UMMZ 52757–73, 52823–30, 52883–906); 9 mi. NE of Fort Davis (USNM 92914); Phantom Lake (UMMZ 49844, 55722–3). MEDINA CO.: Diversion Lake (CM 8467). PECOS CO.: Ft. Stockton (USNM 32968); 20 mi. E of Ft. Stockton (USNM 32969). PRESIDIO CO.: Paisano (USNM 32966–7). REEVES CO.: Weinach's Draw (UMNZ 49837–40, 55724); Toyah (USNM 32963); Vitro Draw (UMMZ 49843, 49845, 49847–50, 51412). VALVERDE CO.: East Painted Cave (USNM 32960). NEW MEXICO: Forks of Ruidoso Creek (USNM 25382). OTERO CO.: Cornudo and Alamo Mts. (UMMZ 71128–33). EDDY CO.: Dark Canyon, Guadelupe Mts. (UMMZ 70082–3[13]). GRANT CO.: 3 mi. SW of Santa Rita (MVZ 13841); 5 mi. NW of Silver City (UMMZ 75692); Big Burro Mts. (MVZ 7050–4); 13 mi.

N of Mimbres (UMMZ 79208[6]); 8 mi. N of Mimbres (LMK 26114–5); Allie Canyon, 5 mi. NW of Mimbres (LMK 25963); 5 mi. NW of Pinos Altos (UMMZ 75693); Santa Rita (USNM 47103–7); Hachita (USNM 45100–2). LUNA CO.: Deming (ANSP 1). SIERRA CO.: 12 mi. above Hermosa (UMMZ 60030–4); Grafton (USNM 13729–31); Chloride (USNM 44598, 44571). SOCORRO CO.: Magdalena Mts., near Kelley (LSJU 3715; USNM 58513). ARIZONA: COCHISE CO.: Apache (USNM 8493).

NUEVO LEÓN: 4 mi. W of Sabinas Hidalgo (EHT 8738–9); Cienega de Flores, 30 km. S of Monterrey (EHT 8740–1); Huasteca Cañon, 11 mi. W of Monterrey (EHT 8742–4). COAHUILA: Saltillo (ANSP 20114). CHIHUAHUA: Montezuma Mt., near Colonia Dublan (BYU 2052–5, 2058).

Sceloporus lineolateralis Smith.

Sceloporus lineolateralis Smith, Proc. Biol. Soc. Wash., **49**, pp. 92–95, 1936.

Type locality.—Six miles northeast of Pedriceña, Durango. Type EHT 4323; paratypes EHT 4321–2, 4324–6, 4332–40, 4342–3, 4363, 7372a and b, 4471–6.

Distribution.—Known only from Durango (fig. 33).

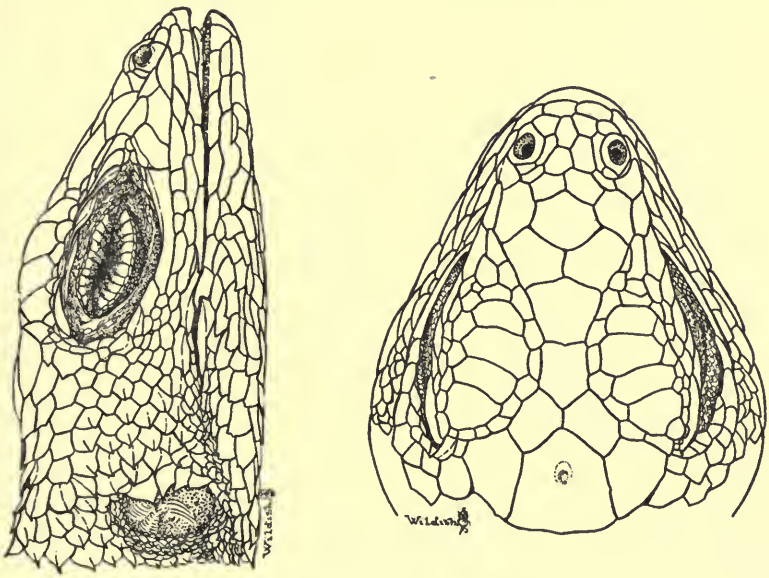

FIG. 31. Head scales of *Sceloporus lineolateralis.*

Diagnosis.—A species of moderate size belonging to the *poinsettii* group; dorsal head scales smooth; lateral scales about half as large

as median dorsals, but not strongly differentiated from them; ventral scales about one-third as large as laterals; longitudinal rows of dorsals converging toward median line; 38 to 47 scales from occiput to base of tail; length of tibia about equal to length of shielded part of head; length of fourth toe about equal to distance between snout and posterior margin of ear; hind limb reaches to ear; 14 to 20 femoral pores, not extending onto preanal region; enlarged supraoculars in a single row; two canthals; a narrow uninterrupted black collar on neck, arising from shoulder, with a light, sometimes medially interrupted, posterior border; sides of belly in males china blue, very slightly darker medially; gular region very pale blue.

Sceloporus jarrovii jarrovii Cope.

Sceloporus jarrovii Cope, U. S. Geog. Geol. Surv. W. 100th Mer., **5**, p. 569, 1875.

Sceloporus jarrovii jarrovii Smith, Kans. Univ. Sci. Bull., **24**, p. 624, 1938.

Type locality.—Southern Arizona. Cotypes USNM 8494 (2 specimens) and 8495.

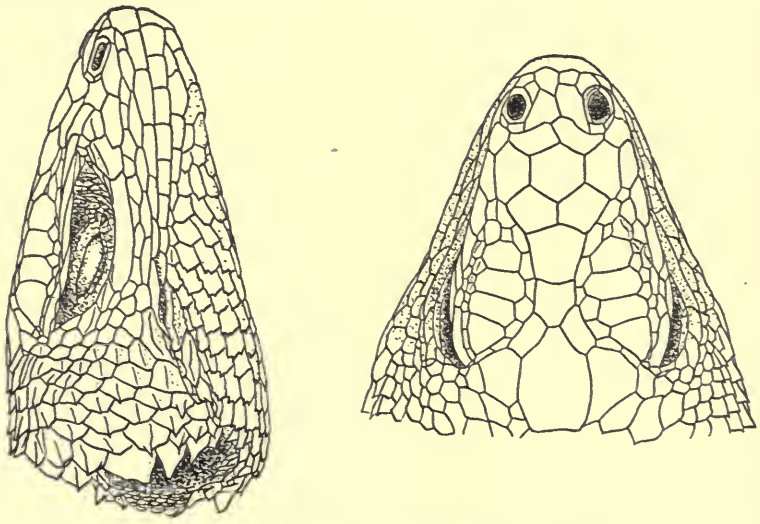

FIG. 32. Head scales of *Sceloporus jarrovii jarrovii.*

Distribution.—Central Arizona east to western New Mexico, and south through Chihuahua and western Sonora to extreme western Zacatecas and extreme northern Tepic (fig. 33).

Diagnosis.—Dorsal scales 38 to 46 from occiput to base of tail; dorsal scales denticulate, weakly carinate; largest lateral scales somewhat larger than median dorsals; hind leg 54 to 66 per cent of

snout-vent measurement; fourth toe 19 to 25 per cent of snout-vent measurement; enlarged supraoculars in one series, bordered laterally by three rows of scales, two or three of which are incomplete; the inner of these three rows is composed of the largest scales; frontal usually in contact with interparietal, or separated by an azygous scale; prefrontals usually in contact; first canthal seldom forced above canthal ridge by contact of second canthal and subnasal; preocular usually not divided; usually two complete rows of scales below subocular. Black nuchal collar three or four scales wide, with a narrow light border sometimes not well defined; a suffusion of black, confluent with the collar, may occur over the neck and back; a light line two scales broad passes from the nuchal collar to the temporal region; scales on rest of dorsal surface black, with a light spot in the center of each scale.

Locality records.—NEW MEXICO: HIDALGO CO.: Animas Peak (USNM 45064, 45079–83, 45084[2], 45085); Big Hatchet Mts. (USNM 45103). ARIZONA: (LAM 674[2], 659[5]; USNM 8611, 20570); southern Arizona (USNM 8495, type); Santa Rita and Huachuca Mts. (USNM 56808–11); Graham Mts. (USNM 1440–8, 51456); Camp Rucker (USNM 11863); White River Canyon (USNM 10194). COCHISE CO.: (MVZ 8093; LAM 114–122); Chiricahua Mts. (LSJU 2119, 2132, 2136, 2152–3, 2157, 2162, 2175, 2178, 2183; MVZ 7811; CM 6281–5; UMMZ 71124–6[23], 71420[3]; USNM 73734); Barfoot, 8,500 feet, Chiricahuas (UCLA 348–9, 351, 443; MVZ 7812–4; SDSNH 15613–26); Paradise, Chiricahuas (CAS 35018–36); Cave Creek, Chiricahuas (MVZ 7815; ANSP 17529; CM 6647–8); Horsfall Canyon, Chiricahuas (MVZ 7809–10); summit of Ida's Peak, Chiricahuas (MVZ 7803); Pinery Canyon, 6,000 feet to 6,700 feet (MVZ 7791–802, 7804–8, 7816; SDSNH 15789–91); 6 mi. W of Paradise, Chiricahuas (MVZ 18956–7); Rhyolite Canyon, Chiricahuas (MVZ 18950–5); Rustler's Park, 8,500 feet to 9,000 feet, Chiricahuas (SDSNH 15602–12, 15627–36); East Turkey Creek, 6,500 feet to 8,000 feet, Chiricahuas (SDSNH 15637–81); Rock Creek Canyon, 7,500 feet to 9,000 feet, Chiricahuas (SDSNH 15682–94, 15715–25); Ward Canyon, 7,500 feet, Chiricahuas (SDSNH 15695–714); Huachuca Mts. (LSJU 658–62, 664, 667, 670–1, 673, 675, 677–87, 689–92; CAS 34758–881, 48106–270; AMNH 7804–5, 14590–1, 14599, 14735, 14945, 14977–86, 14988–15043, 18601–8, 18619–37, 18699, 20486–90, 46014–7; MCZ 14836–56, 11986, 29736–60; UMMZ 44985–6, 56038–43, 70291[5], 75762–5[8]); Ash Canyon, Huachucas (LMK 1642–5; UMMZ 69897); Carr Canyon, Huachucas (LMK 3351–63; SDSNH

14522–603; ANSP 16510–3, 16515–23, 16525–7, 16489; UMMZ 69891–2[14]); Ramsey Canyon, Huachucas (LMK 3364–6, 3368, 3370–83; UMMZ 69893–5[59], 69898[9], 69900[10], 71117–21[38], 71319[2]; SDSNH 14604–91); Miller Canyon (LMK 5194–5; SDSNH

FIG. 33. Distribution of *Sceloporus lineolateralis*, △; *S. jarrovii jarrovii*, ○; *S. j. minor*, ⊖; and *S. j. immucronatus*, ▽.

14743–77; UMMZ 69896; MCZ 20883–5, 29873–82[17]); Carr Peak, Huachucas (SDSNH 14692–742); Montezuma Canyon, Huachucas (UMMZ 69899); Ft. Huachuca (USNM 19687–9, 21115–7, 22228–30); Fairbank (LSJU 2638–9, 2641, 2608, 2696); Cochise Stronghold, Dragoon Mts. (ANSP 19923–4; UMMZ 65090[14]); Bisbee (AMNH 416–7); 25–30 mi. SE of Dos Cabezas (UMMZ 71122–3[7]); 8 mi. W of Portal (USNM 93068–9). SANTA CRUZ CO.: Santa Rita Mts. (CAS 48290–412; LMK 5703; SDSNH 11097; ANSP 17898, 17900,

17912); Madera Canyon, Santa Rita Mts. (USNM 61403, 61436–7, 61453); Mt. Wrightson, Santa Rita Mts. (MCZ 32135–44; UMMZ 71288[8]). PIMA CO.: Ft. Lowell (LSJU 2126, 2138–40, 2142, 2145–8, 2182, 2435, 2445); Santa Catalina Mts. (USNM 47935–6); Santa Rita Mts. (CAS 47271–89); White House Canyon, Santa Ritas (CM 4491–3); canyon above Florida Camp, Santa Ritas (CM 4490). PEÑAL CO.: Tortilla Mts. (UMMZ 65094). GRAHAM CO.: Ft. Grant (LSJU 799); Mt. Turnbull (USNM 54665–7).

CHIHUAHUA: Pacheco (CAS 50493); Colonia Garcia (BYU 2134–5, 2137–8). DURANGO: El Salto (ANSP 19988, 19990–1). SONORA: El Tigre Mts. (UMMZ 78390–6[35]).

Sceloporus jarrovii minor Cope.

Sceloporus torquatus minor Cope, Proc. Amer. Phil. Soc., **22**, p. 402, 1885.
Sceloporus jarrovii minor Smith, Kans. Univ. Sci. Bull., **24**, p. 631, 1938.

Type locality.—Zacatecas. Cotypes USNM 26166–7, collected by Dugès.

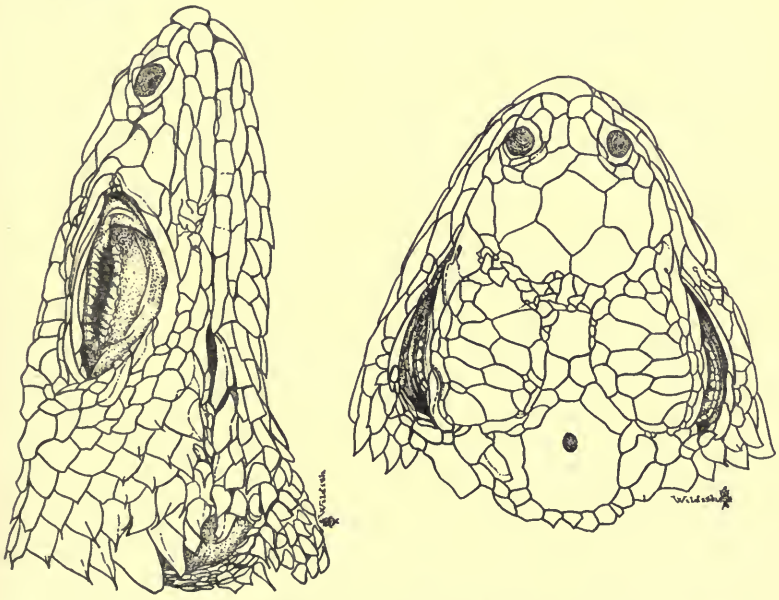

FIG. 34. Head scales of *Sceloporus jarrovii minor.*

Distribution.—Northern Queretaro and Guanajuato, through Mexico, western Zacatecas, and most of San Luis Potosí to southern Coahuila (fig. 33).

Diagnosis.—Dorsal head scales smooth; largest lateral scales subequal in size to, or somewhat smaller than, dorsals, ventrals

much smaller than (about one-fourth as large as) dorsals; femoral pore series short, not extending onto preanal region, sometimes with an extra short series; dorsals 34 to 46 from occiput to base of tail; dorsal scales smooth or very weakly keeled, very weakly mucronate, in parallel or very slightly converging rows; tibia as long as or longer than shielded part of head; fourth toe from base of fifth equal to or greater than distance from snout to ear; supraoculars usually in two complete rows, never in one row; black collar continuous around gular region, on dorsal surface of neck very broad, covering from six to eight scale rows; collar with narrow light borders, sometimes interrupted; adults with a ground color of uniform seal-brown, with distinct narrow light bands on distal portion of tail, not encroaching upon ventral surface; males with sides of abdomen from axilla to groin pale blue, sometimes with a purple suffusion, the median edges and area in groin black or marine blue; throat pale blue, sometimes spotted.

Remarks.—Specimens of *minor* were collected by E. H. Taylor at a locality 55 miles north of Mexico City, associated with *f. ferrariperezi.*

Locality records.—MEXICO: 55 mi. N of Mexico City (EHT 9334–8). SAN LUIS POTOSÍ: Santana, near Catorce (ANSP 20018); Sierra de San Miguelito (ANSP 20017); Alvarez (ANSP 20071–2, 20074, 20076, 20079, 20081, 20084, 20086–90, 20092–4, 20097).

Sceloporus jarrovii immucronatus Smith.

Sceloporus jarrovii immucronatus Smith, Copeia, 1936, pp. 223–227, 1937.

Type locality.—Ten miles north of El Pinalito, Hidalgo, Mexico. Holotype EHT 500; paratypes EHT 498–9, 501–4, 506–8, 510–1, 605–615; E. H. Taylor and H. M. Smith, collectors.

Distribution.—Western Queretaro through Hidalgo to south central Vera Cruz (fig. 33).

Diagnosis.—Head scales smooth; laterals in diagonal rows, weakly keeled, very weakly mucronate; the median laterals somewhat larger than, to one and one-half times as large as, median dorsals; dorsals in parallel longitudinal rows, very weakly keeled, but slightly mucronate, 37 to 46 from occiput to base of tail; supraoculars usually in two rows, the inner complete, the outer incomplete; canthals regularly two; tibia as long as or slightly longer than shielded part of head; fourth toe from base of fifth slightly longer than distance from snout to posterior margin of ear; fourth toe 24 to 29 per cent of snout-vent measurement (in adults); hind leg 64 to 71 per

cent of snout-vent measurement; femoral pores 12 to 19; ground color cobalt blue; collar black, complete, narrow (2 or 3 scales wide), extending across gular fold region in males; region anterior to gular fold and sides of belly cobalt blue; ventral surfaces of limbs and tail

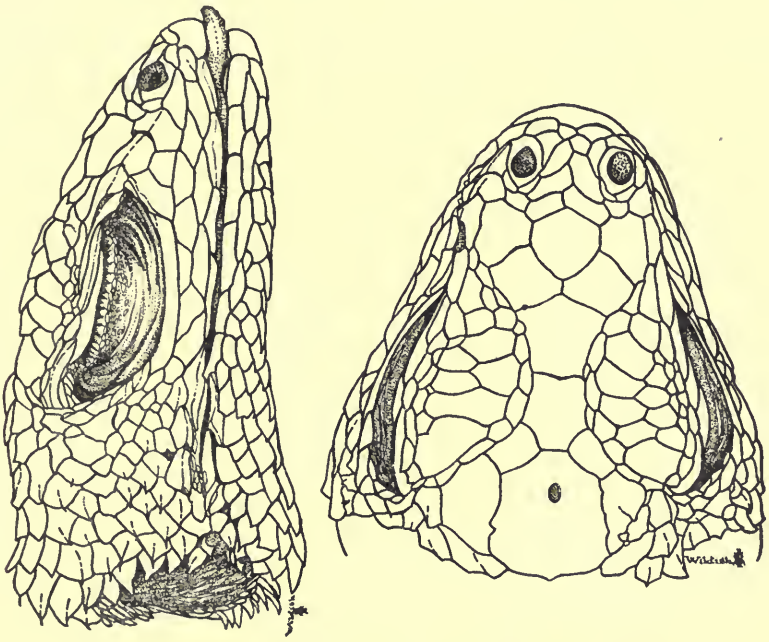

FIG. 35. Head scales of *Sceloporus jarrovii immucronatus*.

glaucous blue to pale blue; median ventral surface of belly in old males black, the color extending onto proximal portion of ventral surfaces of limbs.

Locality records.—HIDALGO: Durango (EHT 9308–9; WM 2); Jacala (WM 1); Minas Viejas (EHT 9281–9307); Cuesta Colorada (EHT 9249–80).

Sceloporus ornatus ornatus Baird.

Sceloporus ornatus Baird, Proc. Acad. Nat. Sci. Phila., **1858**, p. 254, 1859.
Sceloporus ornatus ornatus Smith, Kans. Univ. Sci. Bull., **24**, p. 647, 1938.

Type locality.—Patos, Coahuila. Type USNM 2845. Collected by Lieutenant B. Couch.

Distribution.—Known only from southeastern Coahuila (fig. 37).

Diagnosis.—Dorsal scales 55 to 63 from occiput to base of tail; supraoculars quite irregular or in two rows; posterior section of

frontal reduced in size, broken in small scales, or absent; lorilabials usually reduced to one row below subocular; two canthals, normal in position; inner row of labiomentals terminating below third infralabial; femoral pores 16 to 20 (rarely 14 or 15); hind leg 61 to 66 per cent of snout-vent measurement; fourth toe 20 to 24 per cent of snout-vent measurement; tibia longer than snout-occiput measurement; length of fourth toe usually somewhat less than snout-ear

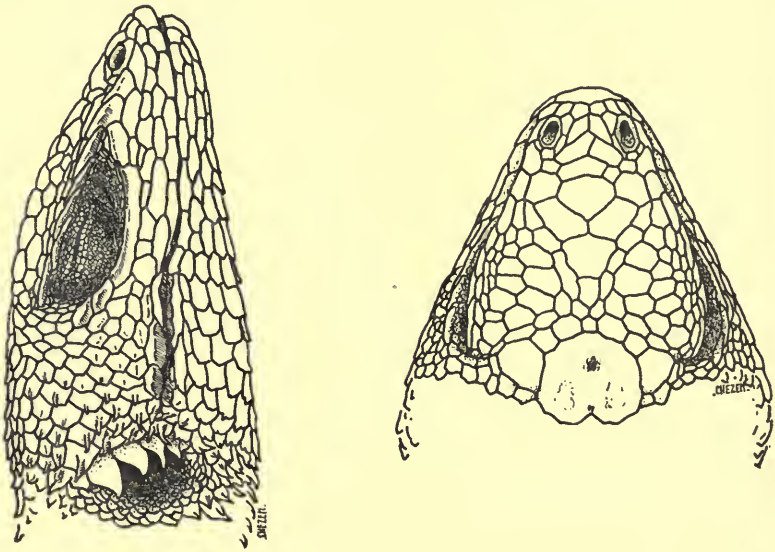

FIG. 36. Head scales of *Sceloporus ornatus ornatus*.

measurement. Neck-band narrow, four to seven scales wide, with narrow, light borders two scales wide; back faintly barred; throat uniform white in females, pale blue in males, without darker markings; males with sides of belly, from axilla to groin, cerulean-blue, bordered medially by a hyacinth-blue line; the blue areas on the sides of the belly are separated by eight to twelve scale rows.

Sceloporus ornatus caeruleus Smith.

Sceloporus ornatus caeruleus Smith, Copeia, **1936**, pp. 227–230, 1937.

Type locality.—Five miles south of San Pedro, Coahuila. Type EHT 350; paratypes EHT 348–9, 351–361; Collected by David H. Dunkle and H. M. Smith.

Distribution.—Known only from type locality (fig. 37).

Diagnosis.—Dorsal scales 47 to 53 from occiput to base of tail; posterior section of frontal reduced or variously divided; supra-

oculars in two rows, the scales of the outer row somewhat smaller than those of the inner row; lorilabials reduced to one row at a point

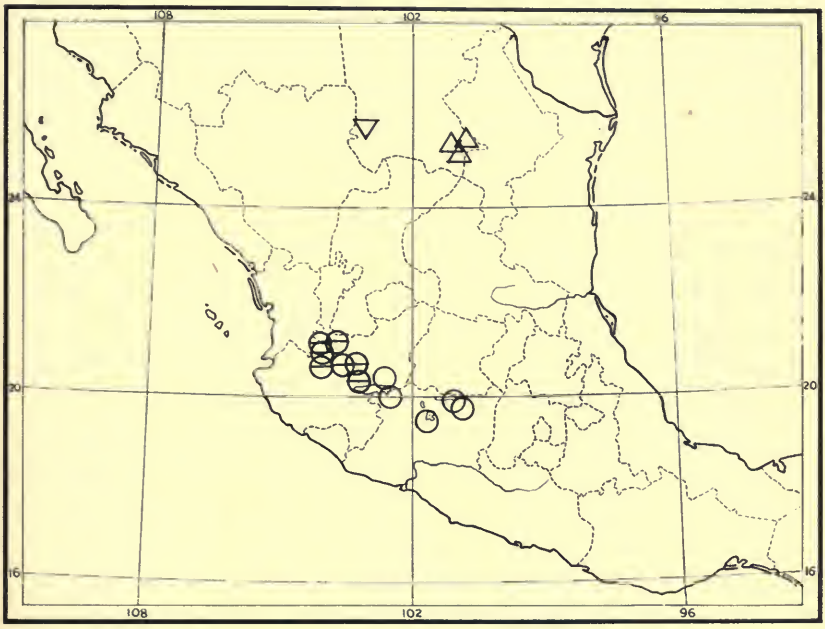

FIG. 37. Distribution of *Sceloporus ornatus ornatus*, △; *S. o. caeruleus*, ▽; *S. dugesii dugesii*, ⊖; and *S. d. intermedius*, ○.

below subocular; two canthals, normal in position; inner row of labiomentals terminating below third infralabial; femoral pores 12 to 17 (average 13.7); hind leg 66 to 75 per cent of snout-vent

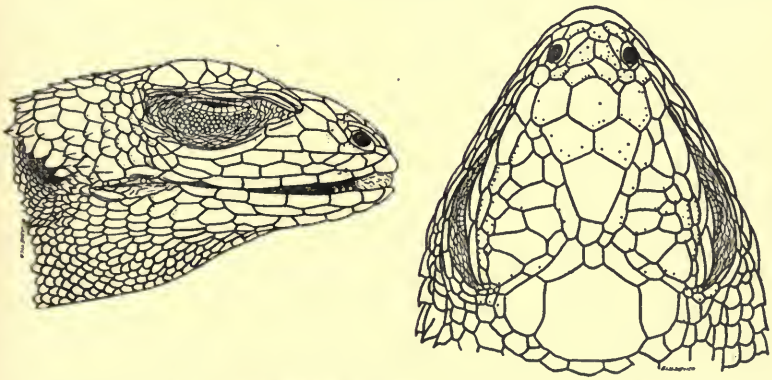

FIG. 38. Head scales of *Sceloporus ornatus caeruleus*.

measurement; fourth toe 23 to 27 per cent of snout-vent measurement; length of tibia greater than snout-occiput measurement; length of fourth toe usually slightly greater than snout-ear measurement, sometimes equal or slightly less. General ground color bluish; nuchal collar four to six scales wide, light-bordered; ventral surfaces of males entirely blue, without darker markings; a series of about seven dark blotches more or less evident on the middle of the back.

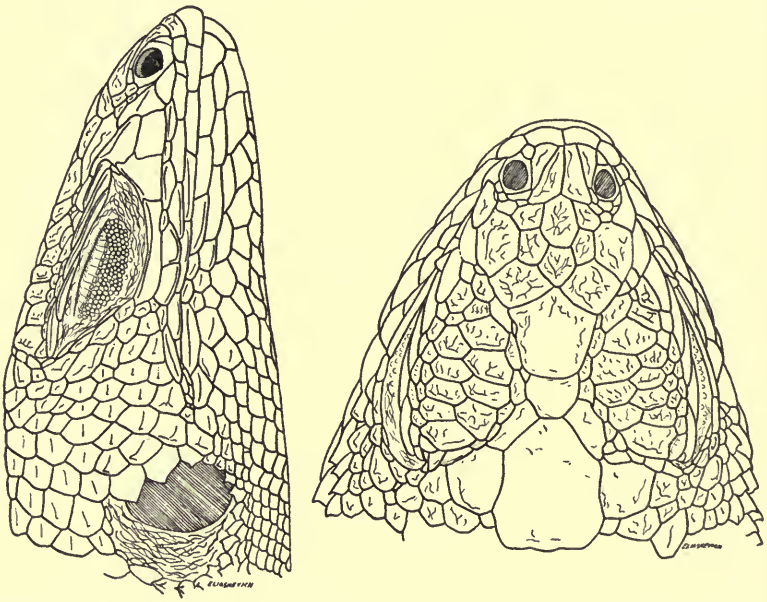

Fig. 39. Head scales of *Sceloporus dugesii dugesii*.

Sceloporus dugesii dugesii Bocourt.

Sceloporus dugesii Bocourt, Miss. Sci. Mex., Zool., **3**, sec. 1, pp. 188–190, pl. 18, figs. 7–7*b*, 1874.

Sceloporus dugesii dugesii Smith, Kans. Univ. Sci. Bull., **24**, p. 657, 1938.

Type locality.—Colima.

Distribution.—Along the coastal ranges of western Mexico from southern Nayarit to Colima (fig. 37).

Diagnosis.—Dorsal scales 41 to 50 from occiput to base of tail; lateral scales larger than median dorsal scales, in oblique rows, and each with an apical mucrone arising within the free margin of the scale; hind leg 52 to 62 per cent of snout-vent measurement; fourth toe 17 to 24 per cent of snout-vent measurement; fourth toe shorter than distance from snout to posterior border of ear; femoral pores

9 to 13; head scales rugose (microscopically); posterior section of frontal reduced; supraoculars in two irregular rows; frontoparietals rarely in contact medially; black nuchal collar narrow, three or four scales wide, with a light posterior border not more than a scale wide, passing onto shoulder; anterior light border of collar absent or indistinct; a faint dark line from eye through upper part of ear to collar, bordered above and below by a narrower light line; back uniform gray or with indistinct darker spots; throat not conspicuously barred. Maximum snout-vent measurement, 87.5 mm.

Sceloporus dugesii intermedius Dugès.

Sceloporus intermedius Dugès, Naturaleza, **4**, pp. 29–34, pl. 1, figs. 21–32, 1877.

Sceloporus dugesii intermedius Smith, Kans. Univ. Sci. Bull., **24**, p. 663, 1938.

Type locality.—Noría, hacienda of D. Epifanio Jiménez near Zamora, Michoacán.

Distribution.—Guanajuato and parts of Michoacán (fig. 37).

Diagnosis.—Dorsal scales 47 to 54 from occiput to base of tail; femoral pores 10 to 15; fourth toe shorter than (rarely about equal to)

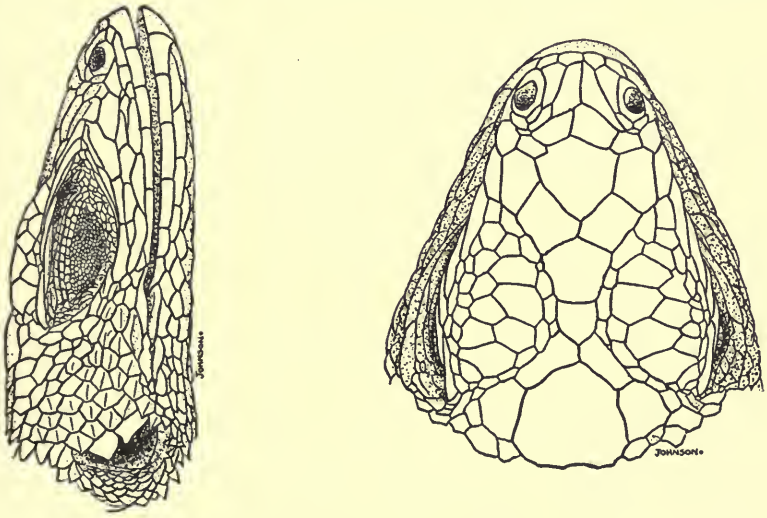

FIG. 40. Head scales of *Sceloporus dugesii intermedius.*

distance from snout to posterior border of ear; hind leg 55 to 61 per cent of snout-vent measurement; fourth toe 20 to 22 per cent of snout-vent measurement; lateral scales in oblique series, the median laterals distinctly larger than median dorsals, and with terminal mucrones arising within free edge of scales; head scales not rugose;

frontoparietals usually in contact; posterior section of frontal reduced; supraoculars in two rows; a series of dark spots down back on either side of mid-dorsal line, with a dark line extending obliquely posteriorly from each; black nuchal collar narrow, about three scales wide, with a narrow light posterior border; anterior light border indistinct; throat with distinct oblique blue bars; sides of abdomen blue, bordered medially by a broad band of black; middle of belly and chest cream; black nuchal collar not confluent on ventral surface; ventral surfaces of limbs and tail cream. Maximum snout-vent measurement 79 mm.

THE VARIABILIS GROUP[1]

Nine species and subspecies compose the *variabilis* group: *couchii* Baird, *cozumelae* Jones, *parvus parvus* Smith, *parvus scutulatus* Smith, *teapensis* Günther; *variabilis marmoratus; variabilis olloporus* Smith; *variabilis smithi* Hartweg and Oliver, and *variabilis variabilis* Wiegmann. Two other described forms have been synonymized: *delicatissimus* Hallowell (1852, p. 178) with *v. marmoratus*, and *Lysoptychus lateralis* Cope (1888, p. 397) with *couchii*.

The forms included in this group are remarkably similar in general features of scutellation, and constitute as uniform and compact a group as exists in the genus. The characteristics of the group are: postfemoral dermal pocket present in all forms; lateral scales of small size; dorsal scales moderate to small in size (minimum 36, maximum 83); ventral abdominal and preanal scales smooth in both sexes; moderate or small size of all forms (maximum snout-vent measurement of smallest species [*parvus*], 50 mm.; of largest species [*variabilis variabilis*], 74 mm.); scales on posterior surface of thigh granular; two canthals; general tendency of anterior section of frontal to be longitudinally divided; general tendency of head scales to be rugose; males with enlarged postanal scales.

All of these characters are shared separately with other species of *Sceloporus*, but no other group possesses all of them. Only two other species of *Sceloporus* (*gadoviae* and *maculosus*) have a postfemoral pocket.

The group ranges from central Texas south along the Atlantic slopes of Mexico to the Isthmus of Tehuantepec, thence south along both coasts to Costa Rica. The species are confined to areas of high mean temperature, and do not usually attain great altitude. *S. v. variabilis* has, however, been recorded at elevations of 14,000 feet on

[1] Approximately 1,808 specimens of the group have been examined.

Mount Orizaba (Blatchley, 1893, p. 40).[1] In western San Luis Potosí and in eastern Querétaro specimens have been collected at elevations estimated at approximately 8,000 feet.

Humidity seems to be a factor controlling the distribution of the species. Forms found in semiarid regions, like southern Texas and

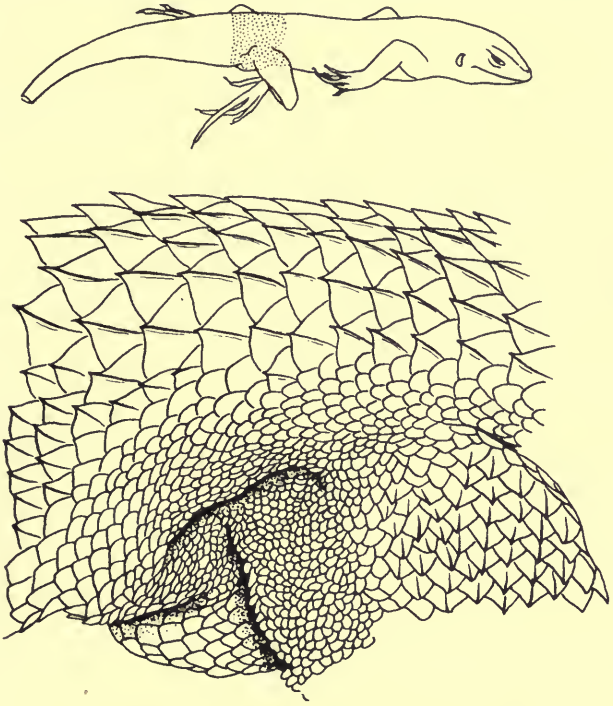

FIG. 41. The postfemoral pocket of *Sceloporus variabilis marmoratus*.

southern Tehuantepec, seek shelter in wooded regions. *S. variabilis marmoratus* is a rather secretive form in its semiarid habitat (southern Texas, northern Mexico), while *v. smithi* is found in wooded mountains, or wooded areas near rivers.

Apparently there are no general geographic trends in variation in the group as a whole. Most of the smaller forms (*parvus parvus, v. marmoratus, couchii*) occur toward the north; but the small *p. scutulatus* occupies an area farther south, and *cozumelae* is about in the middle of the range of the group. The number of femoral pores, in

[1] This record is questionable, as Blatchley collected specimens of other species that he did not recognize, which normally live at rather high altitudes. Some of these were identified as *variabilis*.

general, increases in the species found farther north, *couchii* having the largest number; *v. marmoratus*, however, does not have as large an average number as *v. variabilis* and *v. smithi*, which are found farther south. In number of dorsal scales, the species to the north tend toward the higher extreme, and *couchii* reaches the maximum

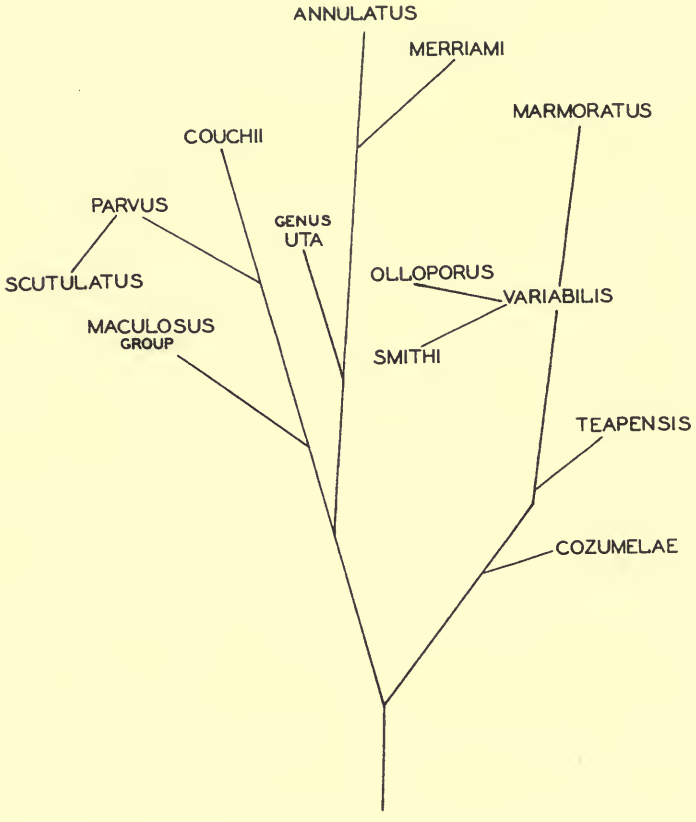

FIG. 42. Phylogeny of the *variabilis*, *maculosus*, and *merriami* groups.

for the group; on the other hand *v. smithi*, located centrally in the group area, has scales as small as *v. marmoratus* and *parvus parvus*.

Even within the species *variabilis*, there is no uniformity in the variation. *S. v. marmoratus* and *v. smithi* with small scales, are found on either side of a centrally located, large-scaled form—*v. variabilis*. *S. v. marmoratus* has a smaller average number of femoral pores than *v. variabilis* or *v. smithi*, and *v. olloporus*, on the south, also has a smaller average number.

The accompanying diagram illustrates my concept of the phylogeny of the species in the group. The *cozumelae* stem exhibits a constant tendency toward decrease in size of scales and in number of femoral pores. The *variabilis* stem, up to *v. variabilis*, shows a general tendency also toward decrease in size of scales and in number of femoral pores, although *v. olloporus* shows a slight increase in size of scales.

That *parvus* and *couchii* are only distantly related to the remainder of the group is shown by the widely different character of the ventral coloration in the males, smooth head scales, larger number of femoral pores, and general habitus. In these also the general tendency is toward a decrease in size of scales, although the femoral pores tend to increase in number. It is my belief that this section approaches more closely the ancestral stock of *Uta* than the other species of the *variabilis* group. That *Uta* did not arise directly from this section of the *variabilis* group is shown by the divergence of *couchii* and *parvus*. It would appear that *merriami* is closely related to *Uta*, and that *Uta* arose from the forms now extinct which closed the present gap between *couchii* and *merriami*.

Another group closely related to the *variabilis* section is the *siniferus* series, which closely approaches the *variabilis* group through *cupreus* (see discussion of *siniferus* group for details). The *chrysostictus* group is also closely related.

The more obvious systematic problems in this group are: significance of the small-scaled variant of *v. variabilis* in eastern Querétaro; exact area of intergradation of *v. variabilis* and *v. olloporus;* significance of the variation in scutellation of the island specimens of *cozumelae;* and validity and ranges of the subspecies of *parvus*. The problems in ecological distribution and life history are numerous.

KEY TO SPECIES AND SUBSPECIES OF THE VARIABILIS GROUP

1.—Series of femoral pores separated medially by no more than six scales.....2
Series of femoral pores separated medially by ten or more scales.....3

2.—Dorsal scales 69 to 76; scales around body 70 to 81; dorsal scale rows at nape 18 to 21.....*parvus scutulatus* (p. 255)
Dorsal scales 58 to 69; scales around body 61 to 69; dorsal scale rows at nape 15 to 18.....*parvus parvus* (p. 251)

3.—Ventral interfemoral scales separated from ventral thigh scales by a group of small scales one-third or one-fourth size of adjacent scales; a rudimentary gular fold; lateral scales much less than half size of ventral scales; dorsal scales 69 to 83.....*couchii* (p. 240)
Ventral interfemoral scales more or less continuous with ventral thigh scales; no rudimentary gular fold; lateral scales more than one-half size of ventral scales; dorsals usually less than 69.....4

4.—Dorsal scales 36 to 47; subnasal usually absent; shank and posterior surface of lower foreleg distinctly banded; spots on back distinct in both sexes; preocular usually divided; frontoparietals usually in contact medially.
teapensis (p. 256)

Dorsal scales 47 or more.....5

5.—Males and females immaculate below; femoral pores usually nine or less on each side (occasionally more in females); dorsal scales 48 to 55; frontoparietals usually separated by an azygous scale; preocular usually entire; subnasal rarely present.....6

Males with red, blue-bordered areas on sides of abdomen; subnasal usually present; frontoparietals usually in contact medially; preocular usually divided.....7

6.—Postrostrals usually two, never four; scales around body usually 53 to 58.
cozumelae (mainland) (p. 250)

Postrostrals usually four, rarely two or three; scales around body usually 59 to 64.....*cozumelae* (typical) (p. 246)

7.—Dorsal scales 59 or more.....8

Dorsal scales usually less than 59; dorsolateral light lines one and two half scale rows wide posteriorly; maximum snout-vent measurement about 74 mm.....9

8.—Dorsolateral light stripes very distinct, two and two half scale rows wide posteriorly; females with sides of belly marked as in males, but less distinctly; maximum snout-vent measurement 71 mm.
variabilis smithi (p. 278)

Dorsolateral light stripes not so distinct, one and two half scale rows wide posteriorly; spots between dorsolateral light stripes very distinct; females with sides of belly immaculate; maximum snout-vent measurement 53 mm.
variabilis marmoratus (p. 272)

9.—Femoral pores 12 or more.....*variabilis variabilis* (p. 262)

Femoral pores 11 or less.....*variabilis olloporus* (p. 282)

Sceloporus couchii Baird.

Sceloporus couchii Baird, Proc. Acad. Nat. Sci. Phila., **1858**, p. 254, 1859; idem, in Emory, U. S.-Mex. Bound. Surv., **2**, pt. 2, No. [3], p. 6, 1859; Müller, Reisen Ver. Staaten, Canada, Mex., **3**, p. 602, 1865; Bocourt, Miss. Sci. Mex. Zool., **3**, sec. 1, p. 192, 1874; Cope, Bull. U. S. Nat. Mus., **1**, pp. 48, 92, 1875; Dugès, Natureleza, **4**, p. 30, 1877; Yarrow, Bull. U. S. Nat. Mus., **24**, pp. 58, 189, 1883; Yarrow, Smithson. Misc. Collec., **517**, p. 10, 1883; Garman, Bull. Essex Inst., **16**, p. 17, 1884; Boulenger, Cat. Liz. Brit. Mus., **2**, pp. 217, 231, 1885; Garman, Bull. Essex Inst., **19**, pp. 133–134, 1887; Boulenger, Proc. Zool. Soc. Lond., **1890**, p. 78, 1890; Günther, Biol. Cent.-Amer., Rept. Batr., p. 73, 1890; (?) Cope, Amer. Nat., **30**, p. 1014, 1896; Boulenger, Proc. Zool. Soc. Lond., **1897**, pp. 477, 522, 1897; Cope, Ann. Rept. U. S. Nat. Mus., **1898** pp. 335, 341, 395–397, fig. 66, 1900; Brown, Proc. Acad. Nat. Sci. Phila., **55**, p. 552, 1903; Stejneger, Proc. Biol. Soc. Wash., **17**, pp. 17, 19, 1904; Strecker, Baylor Bull., **18**, No. 4, p. 19, 1915; Stejneger and Barbour, Check List N. Amer. Amph. Rept., p. 53, 1917; Dickerson, Bull. Amer. Mus. Nat. Hist., **41**, p. 468, 1919; Stejneger and Barbour, Check List N. Amer. Amph. Rept., 2nd ed., p. 55, 1923; idem, Check List N. Amer. Amph. Rept., 3rd ed., p. 60, 1933; Smith, Proc. Biol. Soc. Wash., **47**, pp. 121, 123, 129–131, 1934; idem, Trans. Kans. Acad. Sci., **37**, p. 265, 1934; Burt, Trans. Kans. Acad. Nat. Sci., **38**, pp. 276, 278, 299, 305, 1936; Ditmars, Rept. N. Amer., pp. 48, 54, 1936; Dunn, Proc. Acad. Nat. Sci. Phila., **88**, pp. 473, 474, 1936; Burt, Papers Mich. Acad. Sci., **22**,

p. 534, 1937; Smith, Occ. Papers Mus. Zool. Univ. Mich., **358**, pp. 2–3, 1937.

Lysoptychus lateralis Cope, Proc. U. S. Nat. Mus., **11**, pp. 397–398, pl. 36, fig. 1, 1888—San Diego, Duval County, Texas; idem, Ann. Rept. U. S. Nat. Mus., **1898**, pp. 328–330, fig. 47, 1900; Stejneger, Proc. Biol. Soc. Wash., **17**, p. 19, 1904; Strecker, Baylor Bull., **18**, No. 4, p. 19, 1915; Dickerson, Bull. Amer. Mus. Nat. Hist., **41**, p. 468, 1919.

Sceloporus lateralis Boulenger, Proc. Zool. Soc. Lond., **1890**, p. 78, 1890.

Type locality.—Santa Caterina, Nuevo León, Mexico. Cotypes U. S. Nat. Mus. No. 2739 (9 specimens). Collected by Lieut. Couch.

Distribution.—Southern Texas, eastern Coahuila, and central and northern Nuevo León (fig. 43).

History and status.—Among the nine specimens described by Baird in 1859 as *Sceloporus couchii*, is a single specimen (with a white

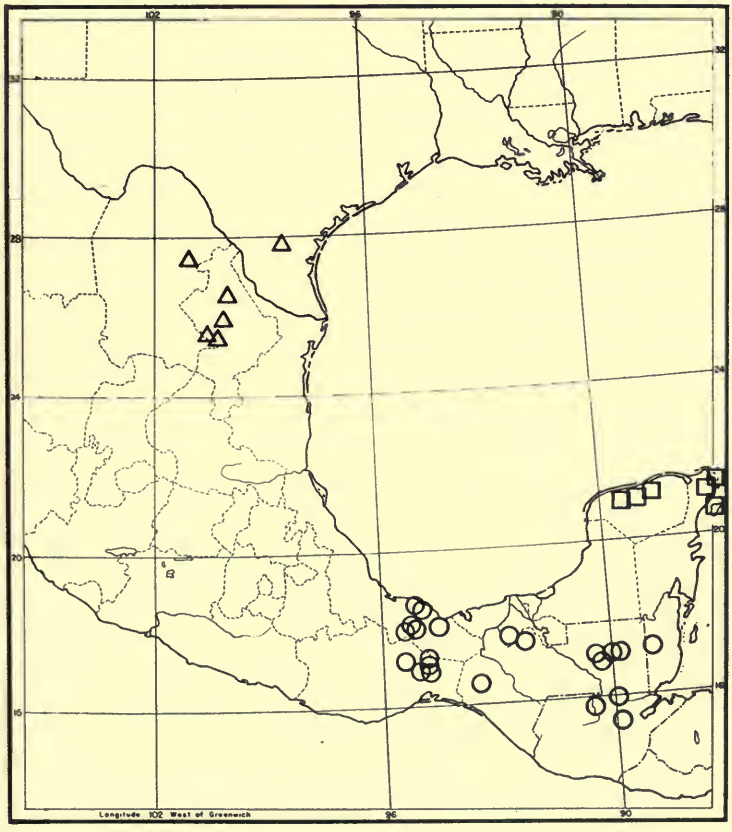

FIG. 43. Distribution of *Sceloporus couchii*, △; *S. teapensis*, ○; and *S. cozumelae*, □.

tag on leg) of *S. parvus parvus*. To avoid, if possible, confusion of identity of these two forms, I designate 2739B (the letter scratched on tag) as lectotype. The specimen is a typical *couchii* as heretofore considered.

The single specimen (No. 14741, U. S. Nat. Mus.) described by Cope (1888, pp. 397–398) as the type of a new genus and species (*Lysoptychus lateralis*) is, as pointed out by Stejneger (1904, p. 19), a typical *couchii*. The specimen was preserved in such a manner as to make a fold across the neck, which formed the basis for the erection of the genus.

Diagnosis.—A medium-sized species of the *variabilis* group (snout-vent measurement, maximum, about 60 mm.); head scales smooth; frontoparietals usually divided into two on each side, in contact medially (usually); anterior section of frontal usually divided longitudinally; prefrontals usually separated by an azygous scale; frontonasals three, normal in size and relationships with other scales; subnasals usually absent; preocular never divided; a group of granular scales extending ventrad between the lateroventral scales in front of insertion of foreleg; dorsal scales 69 to 83 from occiput to base of tail; lateral abdominal scales very small, no greater than one-fifth size of scales on anterior surface of thigh; femoral pores 14 to 20, usually 15 to 17; a postfemoral dermal pocket present. Females olive-gray above, with a series of seven or eight rounded dark spots on each side of median dorsal line, these spots small on neck, increasing in size posteriorly; males with an irregular black band on sides; sides of belly blue in males; gular area with oblique blue bars (males).

Description.—Head and body somewhat flattened; dorsal and lateral head scales pitted, all smooth except lorilabials; interparietal pentagonal, about three and one-half times as large as either parietal; parietal subtriangular, usually not divided; frontoparietals generally two on each side, in contact medially (usually); anterior section of frontal commonly divided longitudinally; supraoculars four to six, usually separated from the median head scales by a row of small scales (sometimes incomplete); two or three incomplete rows of scales between supraoculars and superciliaries; generally six, occasionally seven, superciliaries visible from above; prefrontals usually separated medially by an azygous scale; frontonasals three, the lateral scales in contact with second canthal, the median scales in contact with either lateral frontonasal; a pair of large internasals regularly present, separated from nasals on each side by a small, elongate scale; a large scale inserted posteriorly between internasals,

bounded on either side by a smaller scale in contact with the posterior edges of the internasals, and occasionally inserted between the lateral and median frontonasals on their respective sides, contacting with the prefrontals; subnasal usually present; first canthal large, in contact with lorilabials; second canthal somewhat smaller than first canthal; loreal single, square; preocular not divided, with a heavy keel near the upper edge; subocular large, strongly keeled; lorilabials in one complete and another incomplete row, some of the scales weakly keeled; one row of lorilabials below subocular (rarely a supralabial narrowly contacts subocular); supralabials three and one-half to four and one-half to a point below middle of eye; about four infralabials to a point below middle of eye.

Mental pentagonal, with a labial border slightly more than one-half that of rostral; a series of about five postmentals posterior to mental; anterior scale of each series in contact with each other medially, others separated; a single row of labiomentals extending anteriorly between the posterior portion of the first postmental and first infralabial; scales across gular fold region with a single, apical notch; posterior gular scales smaller than anterior gular scales.

Auricular lobules several, two or three of these larger than others, extending slightly less than halfway across ear opening, smooth, pointed, much larger than preceding scales; temporal scales keeled, not mucronate, some with an apical pit, about two or three times as large as scales between ear and arm; lateral nuchal pocket very deep; a complicated series of folds on side of neck; a large, loose fold extending from upper edge of nuchal pocket to a point above insertion of foreleg (not surmounted by enlarged scales); a loose fold from upper edge of nuchal pocket to upper edge of ear (surmounted by slightly enlarged scales); a weak fold from lower edge of nuchal pocket to a point below middle of ear (surmounted by slightly enlarged scales); granules on side of neck inserted between scales in front of insertion of foreleg three or four rows behind posterior edge of nuchal fold (a rudimentary gular fold); lateral nuchal scales continuous with dorsal scales at a point above arm, and at another point above ear.

Dorsal scales in about 20 longitudinal rows across nape, the outer row on each side differentiated from lateral scales (at nape) only from a point about halfway between ear and lateral nuchal pocket to a point above anterior margin of insertion of foreleg; dorsals 69 to 83 from occiput to base of tail, average 75.2; dorsal scales keeled, not mucronate, pointed, not denticulate; about 16 longitudinal rows of dorsal scales at rump; lateral scales keeled,

much smaller than dorsal or ventral scales, gradually merging with granular scales in axilla and in front of hind leg; median ventral scales somewhat smaller than dorsals, smooth and rounded; scales on chest larger than those on belly; granular scales in front of hind leg and on posterior surface of thigh more or less continuous ventrally, separating the ventral interfemoral scales from the ventral thigh scales by small scales about one-third or one-fourth the size of adjacent scales.

Scales on dorsal surface of forelegs keeled, about the same size as dorsals on back, somewhat larger on lower foreleg than on upper foreleg; ventral scales on lower foreleg one-half or one-third size of dorsals of same member, keeled; scales on anterior surface of lower foreleg smooth; ventral scales of upper foreleg very small, weakly keeled; lamellar formula for fingers 9–13–19–19–14 (9–14–19–18–14).

Scales on dorsal surface of thigh subequal in size to dorsal scales on body, those on shank somewhat larger; scales on anterior and ventral surface of thigh smooth, decreasing in size toward series of femoral pores; scales on posterior surface of thigh granular; scales on ventral and concealed surfaces of shank smooth, subequal in size to dorsals of same member; scales at ankle granular; lamellar formula for toes 8–14–22–28–18 (9–13–?–26–20).

A postfemoral dermal pocket present; dorsal caudal scales mucronate, strongly keeled, about one-half or one-third larger than dorsal scales on body; enlarged postanals present in males; scales between these and the anus very small, nearly granular; subcaudal scales smooth except at extreme tip of tail in males; in females, subcaudals weakly keeled at base of tail, smooth distally.

Color.—The sexual dimorphism in this species with regard to color is most remarkable. The females are uniform olive-gray or bluish-olive above, with a series of seven or eight rounded dark spots on each side of the median dorsal line. The spots anteriorly are very small, but they gradually enlarge posteriorly, reaching their maximum size at the base of the tail. There is a faint, slightly darker, broad stripe extending on each side from the upper edge of the tympanum to the base of the tail. The ventral surfaces are tinged with blue, sometimes with faint white oblique stripes on the chin. In a few specimens the dorsal spots on the body are nearly obsolete, but those on the base of the tail and immediately preceding it are constant. In some specimens there are numerous flecks of black in addition to the two dorsal rows of spots.

In males the back is not uniformly colored, but much flecked with black, giving it a generally dark appearance; the lateral dark stripe is black, very prominent, and bordered above by a definite white streak which fades medially into the dorsal gray-blue. A perpendicular blue line passes from a point in front of the insertion of the foreleg to, or nearly to, the dorsolateral light line, and is followed posteriorly by another perpendicular light blue line passing toward the dorsolateral line, but not reaching it; a narrow black line separates the two perpendicular light lines; in front of the anterior light line is a large, rounded, deep black spot, enclosing a small, rounded, bright blue spot; the limbs are banded, the anterior limbs more distinctly than the posterior; the proximal dark band on the foreleg is very distinct; a longitudinal light band is present on the posterior surface of the femur, bordered above and below by an incomplete narrow dark band (present also in females). The entire ventral surfaces are tinged with bluish; a darker blue area, the anterior fourth and posterior edge of which are very dark, is present on each side of the belly, extending from the axilla to the groin, and is bordered medially by a slightly darker band; the anterior part of the gular region is marked with oblique white lines passing from the labial region posteriorly to the median ventral line.

Variation.—Parietals divided into two scales on both sides in four specimens (46 examined); divided into three scales on one side in one. Frontoparietals not divided in 14 counts (of 92), divided into three in eight, into two in 62. Frontal touches interparietal in five. An azygous scale separates the frontoparietals medially in six. The frontal is irregular in one, divided into six scales in two; the anterior section of the frontal is one-half divided in two, completely divided in 34, not divided in eight; the posterior section is transversely divided in one, longitudinally divided in one. The supraoculars vary between four and six, four occurring 23 times, five 43 times, six 26 times (in 46 specimens). Fourteen specimens have one or more supraoculars in contact with the median scales. Prefrontals in contact medially in three; frontal contacts median frontonasal in seven; and an azygous scale separates the prefrontals medially in 36. Nasal contacts rostral in none. Subnasal present on one side in three, on both sides in eight; first canthal in contact with lorilabials in all specimens; preocular never divided; subocular in contact with a supralabial on one side in one; loreal absent (fused with preocular or first canthal) on one side in two specimens, on both sides in one. Femoral pores vary between 14 and 20 (average 16.2), with the

following frequency (108 counts: 14, nine; 15, nineteen; 16 thirty-eight; 17, twenty-six; 18, thirteen; 19, two; 20, one. Dorsals vary between 69 and 83, average 76.2 (61 counts: 69, one; 70, one; 71, three; 72, one; 73, five; 74, seven; 75, eight; 76, four; 77, thirteen; 78, four; 79, six; 80, three; 82, three; 83, two).

The fourth toe is several millimeters shorter in males than in females.

Habits.—Due to a distribution apparently rather discontinuous, this species has remained a rarity in collections. In certain localities however, it occurs in great abundance. In the mountains about four miles southwest of Sabinas Hidalgo, Nuevo León, Dr. E. H. Taylor and I have found the species to be very common. It is obviously a canyon inhabiting species and petricole, contrasting with *parvus parvus,* which is confined to the ground. Our experience in collecting the two species at this locality illustrates this remarkable difference in habitat. As was our custom, we separated soon after leaving camp, in order to cover more territory. Dr. Taylor followed a canyon to the crest of the mountain, while I started up the side of the mountain. When we later met at the camp, all of Dr. Taylor's specimens of *Sceloporus* were *couchii,* while all of mine were *parvus parvus. S. couchii* was found on the rock cliffs on either side of the canyon. It occurs in this habitat almost to the highest elevations in the mountains.

Locality records.—TEXAS: DUVAL CO.: San Diego (USNM 14741, W. Taylor).

COAHUILA: Monclova (MCZ 4560 [2 spec.]). NUEVO LEÓN: Santa Caterina (USNM 2739 [8 spec.]); Pesquieria Grande (Baird, 1859b, p. 6); 4 mi. SW of Sabinas Hidalgo (FMNH 25421–2; EHT 6970–7092); Huasteca Cañon, 11 mi. W of Monterrey (EHT 7093–7117).[1]

Sceloporus cozumelae Jones.

Sceloporus scalaris Cope, Proc. Amer. Phil. Soc., **22**, p. 388, 1885.

Sceloporus variabilis Ives, Proc. Acad. Nat. Sci. Phila., **1891**, p. 459, 1892; Barbour and Cole, Bull. Mus. Comp. Zool., **50**, No. 5, p. 150, 1906 (part).

Sceloporus cozumelae Jones, Occ. Papers Mus. Zool. Univ. Mich., **186**, pp. 1–4, 1927; Gaige, Carnegie Inst. Wash. Publ., **457**, p. 297, 1936; Smith, Occ. Papers Mus. Zool. Univ. Mich., **358**, p. 3, 1937.

[1] Cope (1880, p. 47) mentions *couchii* from Batopilas, Chihuahua, which I consider a *lapsus* for *clarkii,* since in a previous paper (1879, p. 261) describing the collection in full, *couchii* is not mentioned. In 1896 (p. 1014) he mentions the species again from his Chihuahuan district of the Sonoran subregion.

Stone's record of *S. couchii* from Devil's River, Texas, is probably to be referred to *S. merriami.*

Type locality.—Cozumel Island, Yucatan. Type U. S. Nat. Mus. No. 13904.

Distributing.—Northern half of the Yucatan Peninsula and adjacent islands (fig. 43).

Status.—In describing this species, Jones was of the opinion that it was restricted to Cozumel Island. In 1936 Gaige extended the range of the species to the north end of the Yucatan Peninsula (Progreso). There are certain minor differences between specimens from Cozumel Island and those from the Yucatan Peninsula, but I believe these differences are insufficient to warrant recognition of two forms. *S. cozumelae* is related most closely to *S. teapensis*, and belongs with the latter in the *variabilis* group.

Diagnosis.—A *Sceloporus* of medium size (maximum snout-vent measurement 54 mm.); postfemoral dermal pocket present; 46 to 55 dorsal scales from occiput to base of tail; lateral scales in oblique rows directed upward, no less than three-fifths size of dorsal scales, not or poorly differentiated from dorsals; femoral pores six to nine; anterior section of frontal always divided; frontoparietals usually separated medially by an azygous scale; prefrontals always separated by an azygous scale (rarely by two or three small scales); subnasal rarely present; preocular usually not divided; postrostrals usually two or three, rarely four (except Cozumel Island specimens); sides of abdomen in males not distinctively colored; gular region not barred distinctly.

Description.—Head scales rugose to nearly smooth; interparietal large, two-thirds or three-fourths size of supraorbital area; generally a single parietal on each side; usually two frontoparietals, frequently separated medially by an azygous scale; anterior section of frontal always longitudinally divided; supraoculars four to six, usually five; supraoculars separated from median head scales by a complete row of small scales, from superciliaries by two incomplete rows of small scales; usually six superciliaries visible from above; prefrontals always separated medially by an azygous scale (rarely two or three small scales); median frontonasal always divided into two to four scales; lateral frontonasals normal, in contact with both canthal scales; internasal scales irregular; two to four square or subrectangular scales behind rostral; subnasal rarely present; first canthal somewhat larger than second, in contact with lorilabials; loreal single, square; preocular rarely divided, the upper part with a strong keel; subocular large, strongly keeled; one to three strongly keeled postoculars following subocular; usually a single row of lorilabials,

occasionally an additional incomplete row; lorilabials always in one complete row below subocular, the scales usually somewhat imbricating anteriorly, and weakly keeled; three and one-half to four supralabials, and three to four infralabials to a point below middle of eye.

Mental triangular or pentagonal, with a labial border two-thirds to three-fourths that of rostral; a series of four to eight postmentals on each side, the first scales in contact medially; outer row of labiomentals terminating between the first postmental and first infralabial; inner row of labiomentals absent or, if present, terminating below anterior half of third, or posterior half of second, infralabial; posterior gular scales with a single, apical notch; anterior gular scales rounded; median posterior gular scales slightly smaller than other gular scales.

Auricular lobules variable, smooth, when present, pointed, never much larger than preceding scales; temporal scales keeled, not or weakly mucronate, twice as large as lateral scales above nuchal pocket; a fold of skin, surmounted by slightly enlarged scales, extending from lower edge of nuchal fold to lower edge of ear; another fold of skin, not surmounted by enlarged scales, passing from upper edge of nuchal fold obliquely upward and backward to a point above insertion of foreleg; scales between this fold and arm very minute, continuous with granular scales in nuchal pocket.

Dorsal scales 46 to 55, average 50.5; dorsals keeled, mucronate, not or weakly denticulate, in twelve to fifteen rows at nape, nine to twelve at rump; 53 to 63 scales about middle of body; lateral scales keeled, mucronate, about three-fifths size of dorsal scales, no smaller than ventral scales, in oblique rows; ventrals smooth, with an apical notch; ventral scales on chest somewhat larger than abdominal scales; scales in preanal region smaller than ventral abdominals; ventral scales in posterior part of interfemoral region smaller than preanal scales.

Dorsal scales of foreleg keeled, mucronate, slightly smaller than dorsals on body; median ventral scales of lower foreleg about one-half the size of dorsals of same member, keeled toward hand; scales on anterior surface of foreleg smooth; scales on ventral surface of upper foreleg smooth, one-third to one-half size of ventrals on lower foreleg; lamellar formula for fingers 8–12–15–16–10 (8–12–16–16–11).

Dorsal scales of hind leg keeled, mucronate, those on shank somewhat smaller than dorsals on body, and distinctly larger than those on thigh; scales on ventral surface of thigh smooth, decreasing in size toward femoral pore series; scales on posterior surface of thigh

very minute, increasing slightly in size toward femoral pore series; scales on ventral and concealed surfaces of shank smooth, somewhat smaller than dorsals of same member; scales at ankle minute; lamellar formula for toes 8–11–16–20–14 (7–11–17–21–14).

Dorsal caudal scales one and one-half times as large as dorsals on body, strongly keeled, strongly mucronate; subcaudals smooth in males except on distal half of tail; subcaudals in females weakly keeled; enlarged postanals present in males; a postfemoral dermal pocket present.

Color.—General ground color olive-brown (more olive in males, more brown in females); a series of ten undulate, narrow, dark brown spots on each side of the back, separated medially by a gray band about two half to one and one-half scale rows wide, and interrupted on each side by a dorsolateral light line about one and two half scale rows wide; in females the spots extend a short distance on the sides of the abdomen; in males the spots terminate on each side at the dorsolateral light line. Sides of body with scattered light spots. Posterior surface of lower foreleg usually with very distinct alternate light and dark bars; shank with indefinite light and dark bands. Posterior surface of thigh with two irregular black bands separated by a broader white band. Tail with chevron-shaped dark bars, indistinct in males. Ventral surfaces immaculate; in males, ventral surfaces tinged with blue, but with no distinct lateral abdominal marks. Upper labial region with indistinct narrow dark bands; lower labial region in males with indistinct narrow light and dark bands. Lower labial region and a small area at lower edge of lateral nuchal fold orange in females.

Variation.—The variation in scutellation of the head of 23 specimens from the mainland of Yucatan is as follows: parietals one to three (1, six; 2, thirty; 3, five); frontoparietals one to three on each side (1, six; 2, thirty-six; 3, four); frontal touches interparietal in four; frontoparietals contacting medially in three; an azygous scale separates frontoparietals in 16; anterior section of frontal longitudinally divided in all but one; usually seven, occasionally six superciliaries; supraoculars four to six (4, eight; 5, thirty-four; 6, one); some of supraoculars contact median head scales in two specimens 3 on one side, 0 on the other in one, 3 on one side and 2 on the other in the second); prefrontals separated by one to three small scales in all; median frontonasal usually separated from lateral frontonasals; subnasal present on one side in two, on both sides in one; two canthals in all; first canthal in contact with lorilabials in all;

preocular divided on one side in one, on both sides in four; postrostrals two to four (2, twenty-seven; 3, eight; 4, twice); loreal single in all.

In the mainland specimens the dorsal scales vary between 47 and 56, average 50.1; ventral scales, 54 to 66, average 58.9; scales around body 53 to 60, average 56; femoral pores seven to eleven (7, three; 8, nine; 9, eighteen; 10, five; 11, once; 10 only in one male; the count of 11 in a female).

Fifteen specimens from Cozumel Island differ as follows: parietals single on each side in all; frontoparietals one to three (1, twice; 2, twenty-six; 3, two); frontal touches interparietal in three; frontoparietals contact medially in two; an azygous scale separates frontoparietals medially in ten; supraoculars four to five (4, ten; 5, twenty); none of supraoculars in contact with median head scales; subnasal absent in all; preocular entire in all; postrostrals, two to four (2, three; 3, once; 4, eleven); dorsal scales 46 to 53, average 50.3; ventral scales 56 to 66, average 61.4; scales around body 59 to 64, average 60.6; femoral pores seven to nine (7, seven; 8, six; 9, five).

The essential differences are: number of parietals; number of postrostrals; average scale count around body. The first difference is of little significance, as the parietal is variable to a high degree. Its posterior portion may be segmented off and split secondarily into several small scales resembling the temporal scales; every stage may be present from this condition to a single, large parietal. The average scale count around the body would, if it were not for the Mujeres Island specimens, be sufficient for a separation of the mainland and Cozumel Island specimens. The number of postrostrals is too weak a character to segregate subspecies unless large series are studied. The specimens at present available from Cozumel Island are insufficient to show the full extent of variation.

The six specimens from Mujeres Island correspond more closely with the mainland form of *cozumelae*. The scales around body are 55, 56, 57, 58, 62, 63; parietals one or two (2, twice); postrostrals two or three (3, twice); subnasal present.

It is very unusual in the *variabilis* group for a species normally to possess two postrostrals; in fact, the mainland form of *cozumelae* is the only one in this group having this character.

Habits and habitat.—At Progreso, Yucatan, *cozumelae* was observed to be very common in the semiarid plains near the seacoast, associated with *chrysostictus*, to which it is remarkably similar. The soil is sandy, and the vegetation is scant and low.

Locality records.—QUINTANA ROO: Cozumel Island (USNM 13904); near San Miguel, Cozumel Is. (UMMZ 78571 [3 spec.], 78573 [9 spec.]); Mujeres Is. (USNM 47643; UMMZ 78569 [5 spec.], 78570 [2 spec.]). YUCATAN: Isla Cienega, near Progreso (UMMZ 72891–4); Cerro Isla, near Progreso (UMMZ 72895); Progreso (EHT 9956–71; AMNH 38866–9, 38945; UMMZ 71763 [3 spec.]; MCZ 7254[9]); Telchac de Costa, northern coast of Yucatan (UMMZ 79470); Dzilam (Ives, 1891); Puerto Morelos (USNM 47630).

Sceloporus parvus parvus Smith.

Sceloporus couchii Baird, Proc. Acad. Nat. Sci. Phila., **1858**, p. 254, 1859 (part).

(?)*Sceloporus chrysostictus* Dugès, Naturaleza, (2), **2**, p. 479, 1896—Huaxteca Potosina, Guanajuato.

Sceloporus parvus Smith, Trans. Kans. Acad. Sci., **37**, pp. 263–267, pl. 8, figs. 1, 3, pl. 10, fig. 10, 1934 (part).

Sceloporus scalaris Dunn, Proc. Acad. Nat. Sci. Phila., **88**, p. 473, 1936 (part).

Sceloporus parvus parvus Smith, Occ. Papers Mus. Zool. Univ. Mich., **358**, pp. 3–4, 1937.

Type locality.—Five miles west of Sabinas Hidalgo, Nuevo León, Mexico. Type EHT No. 7120, collected by E. H. Taylor and Hobart M. Smith.

Distribution.—Northern Nuevo León to southern San Luis Potosí, west of the Sierra Oriental (fig. 46).

Diagnosis.—A very small *Sceloporus*, maximum body length about 50 mm.; head scales smooth or very slightly rugose; subnasal rarely absent; frontal variable; frontoparietals usually in contact medially, usually two on each side; four postrostrals; dorsal scales 58 to 69 from occiput to base of tail; scales around body 61 to 69; dorsal scale rows at nape 15 to 18; femoral pores 12 to 16 on each side, the two series separated medially from each other by not over six scales; a postfemoral dermal pocket present. Males with a blue area on sides of belly, but not dark-bordered; throat coarsely mottled in males; a dark spot on shoulder, pierced by a vertical light line; an irregular, dark lateral band usually visible; a series of about nine narrow spots on each side of back between shoulders and base of tail; these spots united anteriorly, forming two parallel dark lines, which sometimes extend the full length of the body, replacing the spots.

Description.—Dorsal head scales smooth or very slightly rugose, pitted; interparietal very large, about two-thirds size of supraorbital area; usually two parietals on each side; generally two frontoparietals on each side, in contact medially (usually); anterior section of frontal frequently divided (more frequently in northern specimens); supra-

oculars four to six, generally five; a series of small scales separating supraoculars from median head scales, occasionally incomplete; two incomplete rows of small scales between supraoculars and superciliaries; seven superciliaries, usually six visible from above; prefrontals often separated medially by a single small azygous scale; frontonasals three, the lateral scales contacting the second canthal, the median scale in contact with each lateral frontonasal; a pair of

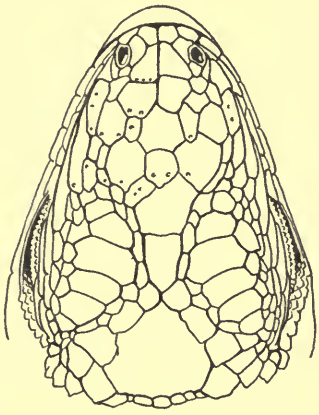

Fig. 44. Head scales of *Sceloporus parvus parvus.*

small, elongate internasals, separated from nasal on each side by another elongate scale, and from rostral by a row of four, small, square scales; subnasal rarely absent; first canthal subequal in size to second canthal, usually not in contact with lorilabials; usually two loreals; preocular frequently divided longitudinally; upper section of preocular strongly keeled; subocular large, strongly keeled; subocular followed posteriorly by two heavily keeled postoculars; lorilabials in one complete and another incomplete row, the scales sometimes weakly keeled; three and one-half to four and one-half supralabials to a point below middle of eye, imbricating posteriorly.

Mental pentagonal, with a labial border less than half that of rostral; a series of five to seven postmentals on each side posterior to mental, the first scales in contact medially; a single row of labiomentals, terminating anteriorly between the posterior part of the first postmental and the first infralabial; some of gular scales with a single, small, apical notch; posterior gular scales in middle somewhat larger than lateral gular scales.

Auricular lobules irregular, usually three moderately large ones, extending one-fourth to one-half the distance across ear opening;

auricular lobules smooth, pointed, slightly larger than preceding scales; temporal scales keeled, not mucronate, larger than scales between ear and arm; scales on side of neck very small or granular, those above and in front of lateral nuchal pocket somewhat larger than those between nuchal pocket and arm; a ridge of skin between upper edge of nuchal fold to upper edge of ear, surmounted by slightly enlarged scales; a fold from lower edge of nuchal pocket to a point below or somewhat posterior to lower edge of ear; a variable fold from upper edge of nuchal pocket to a point above insertion of foreleg.

Dorsal scales keeled, mucronate, not denticulate, in 16 to 18 longitudinal rows at nape, 14 to 16 rows at rump; dorsal scales 58 to 69 from occiput to base of tail, average 62.1; scales in axilla granular, smaller than scales at anterior margin of insertion of hind leg; lateral abdominal scales keeled, not or weakly mucronate, in oblique series passing dorsally, one-third to one-half as large as median dorsal scales; ventral scales smooth, rounded, somewhat smaller than dorsal scales; ventral scales on chest somewhat larger than abdominal scales.

Dorsal scales of foreleg keeled, not mucronate, those on upper foreleg somewhat larger than those on lower foreleg, and somewhat smaller than dorsals on body; ventral scales on lower foreleg keeled, about one-half as large as dorsals of same member; scales on anterior surface of lower foreleg smooth; ventral scales of upper foreleg very minute, smooth; lamellar formula for fingers 8–11–17–16–11 (7–12–17–17–11).

Dorsal scales on thigh subequal in size to dorsal body scales, somewhat smaller than dorsal scales on shank; dorsal scales of hind leg keeled, not or weakly mucronate; scales on ventral surface of thigh smooth, decreasing in size toward femoral pore series; scales on posterior surface of thigh granular, increasing in size toward series of femoral pores; scales on ventral and concealed surfaces of shank smooth, subequal in size to dorsal scales of same member; scales at ankle granular; lamellar formula for toes 8–12–19–22–15 (8–13–19–22–15).

Dorsal scales on tail keeled, mucronate, one and one-half times as large as dorsals on body; subcaudals smooth on proximal half of tail (weakly keeled entire length of tail in females); a postfemoral dermal pocket; enlarged postanals present in males.

Color.—Head light gray, with three narrow transverse bands in supraocular region; a light line passing from posterior labial region

to and slightly beyond ear, bordered above by a narrow black line; a dorsolateral light line on each side of body, narrow and slightly pinkish in color above foreleg, broader and bright blue posteriorly, fading out at base of tail; a bright, pinkish white line from axilla to dorsolateral line, bordered anteriorly and posteriorly by a deep black blotch; posterior black spot followed by another, less distinct, incomplete, narrow light line; a series of about six more complete transverse lines from dorsolateral line, bluish in color, whitish and broader in dorsolateral region, and breaking up into smaller spots and reticulations in lower lateral region, here becoming slightly bluish; lateral blotches below dorsolateral line black; a brownish-black line on each side extending from occipital region to above foreleg, replaced posteriorly to base of tail by a series of eight more or less undulate crossbars, separated medially and bordered posteriorly by light blue; tail with thirteen or more undulate, brownish crossbars; limbs dark, indistinctly banded with bluish, except tibiae, which are strongly banded; belly on each side blue, a narrow median line somewhat lighter; breast whitish; gular region whitish, the posterior part reticulated with black, the anterior part with blue; ventral surface of thigh light, somewhat pinkish or orange; sides of tail blue, white medially.

Variation.—The variation in head scutellation of 34 specimens are as follows: parietals one to three on either side (1, once; 2, sixty-one; 3, six); frontoparietals one to three on either side (1, five; 2, fifty-eight; 3, five); frontal touches interparietal in four specimens; frontoparietals in contact medially in 29; anterior section of frontal longitudinally divided in six, transversely divided in one; supraoculars four to six (4, seventeen; 5, forty-one; 6 ten); from one to five supraoculars contact median head scales in five specimens; prefrontals in contact medially in eight specimens; frontal contacts median frontonasal in three; an azygous scale separates prefrontals in 22; subnasal absent on both sides in two, on one side in two; first canthal in contact with lorilabials on both sides in six, on one side in five; preocular entire on both sides in ten, on one side in one; subocular in contact with supralabials on one side in one, on both sides in four; subocular separated from supralabials by a single row of lorilabials in the remainder.

Dorsals 58 to 69, average 62.1 (36 counts: 58, two; 59, three; 60, seven; 61, five; 62, four; 63, six; 64, one; 65, five; 67, two; 69, one). Ventrals 49 to 69, average 58.7 (27 counts). Scales around body 61 to 69, average 65.6 (29 counts). Dorsal scale rows at nape

15 to 18 (15, seven; 16, nine; 17, nine; 18, three). Femoral pores vary between 12 and 16, the numbers occurring with the following frequency: 12, two; 13, ten; 14, eighteen; 15, twenty-four; 16, eleven (average 14.5).

A number of somewhat confusing geographical variants occur, all tending to separate the Nuevo León specimens from the San Luis Potosí series. The anterior section of the frontal is longitudinally divided only in the Nuevo León series; the prefrontals are in contact in none of this series, but are in contact in 38 per cent of the others; the preoculars are entire in 12.5 per cent of the Nuevo León series, in 40.9 per cent of the others. The Nuevo León series has a maximum scale count of 63 (minimum 58), while the others have a maximum of 69 (minimum 59), with nine specimens over 63. The count of 16 femoral pores does not occur in the Nuevo León series. A number of the variations which appear to be geographically significant would no doubt assume less significant proportions with a larger series available from the north.

Habits.—The specimens from Sabinas Hidalgo were collected in shady areas on the ground, amongst leaves in the ravines in the foothills of the mountains. Due perhaps in part to their protective coloration, specimens were extremely difficult to collect.

Locality records.—NUEVO LEÓN: Hda. Pablillo, above Galeana (ANSP 20005); Santa Caterina (USNM 2739 [1 spec. with white tag on leg]); 5 mi. SW of Sabinas Hidalgo (EHT 7118–26, 7130–3). SAN LUIS POTOSÍ: Charcas (UMMZ 77289[16], 77290[3], 77291–3, 77272[10]); Sierra de San Miguelito, about 30 mi. S of San Luis Potosí (MCZ 4535[2]).

Sceloporus parvus scutulatus Smith.

Sceloporus microlepidotus Cope, Proc. Amer. Phil. Soc., **22**, p. 384, 1885 (part); idem, Bull. U. S. Nat. Mus., **32**, p. 36, 1887 (part).

Sceloporus parvus Smith, Trans. Kans. Acad. Sci., **37**, pp. 263–267, 1934 (part); Martin del Campo, Anal. Inst. Biol., Mexico, **7**, p. 275, fig. 3, 1936; idem, **8**, p. 263, fig. 3, 1937.

Sceloporus parvus scutulatus Smith, Occ. Papers Mus. Zool. Univ. Mich., **358**, pp. 4–6, 1937.

Type locality.—A locality 30 miles north of Matehuala, San Luis Potosí. Type EHT No. 7129.

Distribution.—Northwest San Luis Potosí, south along the Sierra Oriental to southern Hidalgo (fig. 46).

History.—In 1885 Cope reported upon a collection secured by himself and Dr. Santiago Bernad near Zacuáltipan, Hidalgo, record-

ing *S. microlepidotus*, among other things. At present there exists in the Philadelphia Academy a series of *microlepidotus* from this locality, among which are five *parvus scutulatus*. The specimens bear the data "Cope Coll.," and I presume them to be the specimens reported by Cope. Apparently these are the only specimens which reached American museums until recent years.

Diagnosis.—A very small *Sceloporus*, maximum body length about 50 mm.; head scales smooth or very slightly rugose; subnasal rarely absent; anterior section of frontal not longitudinally divided; frontoparietals two, usually in contact medially; preocular occasionally entire; dorsal scales 69 to 76, average 72; scales around middle of body 70 to 81; dorsal scale rows at nape 18 to 21; femoral pores 13 to 16 on each side, the two series separated medially by not over six scales; a postfemoral dermal pocket present. Males with a blue area on sides of belly, but not dark-bordered; throat coarsely mottled in males; a dark spot on shoulder, pierced by a vertical light line; an irregular, dark lateral band usually visible; a series of about nine narrow spots on each side of back between shoulders and base of tail; these spots united together anteriorly, forming two parallel dark lines, which sometimes extend the full length of the body, replacing the spots.

Variation.—The variation in the eight specimens available for study has been set forth in full in the description of *scutulatus* (Smith, 1937).

Habits and habitat.—The specimens from near Matehuala were found in a semiarid region. They were seen on the ground near yuccas, into which they would dash when alarmed. It was only with great difficulty that the three specimens were captured, as it was necessary to tear the yuccas almost completely to pieces before the lizards would leave them.

Locality records.—SAN LUIS POTOSÍ: 30 mi. N of Matehuala (EHT 7127–9). HIDALGO: Zacuáltipan (ANSP 12560–1, 16025, 16027–8); La Peña (Martín del Campo, 1936, p. 275).

Sceloporus teapensis Günther.

Sceloporus variabilis[1] Ruthven, Rept. Mich. Acad. Sci., **14**, p. 231, 1912 (part); idem, Zool. Jahrb., Syst., **32**, pp. 300, 301, 302, 319–320, 1912; Schmidt, in Shelford, Naturalists Guide Amer., p. 602, 1926; Stuart, Occ. Papers Mus.

[1] Numerous references to *Sceloporus variabilis* from the region inhabited by *teapensis* refer in part to the latter form. It is not possible to disentangle this synonymy without examination of the specimens in question. Some of the references are, of course, merely nominal.

Zool. Univ. Mich., **292**, p. 11, 1934; idem, Misc. Publ. Mus. Zool. Univ. Mich., **20**, pp. 8, 21, 26, 30, 31, 33, 1935.

Sceloporus teapensis Günther, Biol. Cent.-Amer., Rept. Batr., pp. 75–76, 1890; Boulenger, Proc. Zool. Soc. Lond., **1890**, p. 78, 1890; Stuart, Copeia, **1937**, p. 68, 1937; Smith, Occ. Papers Mus. Zool. Univ. Mich., **358**, pp. 6–9, 1937.

Sceloporus cupreus[1] (non Bocourt) Boulenger, Proc. Zool. Soc. Lond., **1897**, pp. 477, 518–519, 1897; idem, **1898**, p. 915, 1898.

Type locality.—Teapa, Tabasco. Types in British Museum (6).

Distribution.—Southern Vera Cruz and northeastern Oaxaca, eastward through Chiapas, Tabasco, and Campeche and through the Petén region to British Honduras; southward to Coban, Alta Verapaz (fig. 43).

History.—The status of *teapensis* and the reasons for distinguishing it have been set forth in full in my account of the *variabilis* group (1937).

Diagnosis.—Head scales strongly rugose; anterior section of frontal usually not longitudinally divided; subnasal often absent (or fused with first canthal); preocular usually divided; median frontonasal rarely entire; prefrontals occasionally in contact with each other; frontal rarely in contact with interparietal; dorsal scales 36 to 47, average 43.2; scales on posterior surface of thigh granular; a postfemoral dermal pocket present; scale rows across nape 9 to 12, usually 10 or 11; scales across rump 8 or 9 (rarely 10). A pigmented dorsolateral light stripe line on each side, one and two half scale rows wide, originating at posterior corner of eye and terminating on tail; two series of about ten dark spots on body between dorsolateral light lines, the series separated medially by a faint median light line; limbs with distinct dark bands; a black spot in axilla, extending onto shoulder, bordered anteriorly by a light line originating on arm; sides of belly, in males, with a blue-bordered pink or lavender area, separated from each other by a median light line.

Description.—Dorsal head scales strongly rugose or keeled; a pair of frontal ridges faintly evident; interparietal extremely large (approximately two-thirds size of supraorbital area); parietals irregular, generally two on each side, the anterior subtriangular in shape; usually two frontoparietals on each side; frontal usually separated from interparietal by contact of frontoparietals; frontal transversely divided, the anterior section usually longitudinally divided; usually five supraoculars on each side, frequently separated

[1] *Sceloporus cupreus* Gadow, Jorullo (pp. 55, 65, 1930), cannot be correct; I suspect his specimens may have been *utiformis*.

from median head scales by a single row of small scales (occasionally one or more may narrowly contact median head scales); two incomplete rows of small scales between supraoculars and superciliaries; six or seven superciliaries visible from above; prefrontals rarely in contact with each other, frequently separated by an azygous scale (never by contact of frontal and median frontonasal); lateral frontonasals present, in contact with posterior canthal; median frontonasal irregular, broken into several scales (usually five or six); internasals irregular; nasal never in contact with rostral; subnasal generally present; first canthal very large; second canthal about two-thirds size of first canthal; a single, large loreal; preocular usually divided anteroposteriorly; upper section of preocular with a strong keel; subocular large, strongly keeled; one row of lorilabials, occasionally a few additional small scales inserted; lorilabials keeled, usually slightly imbricating anteriorly; upper labials imbricating anteriorly, three and one-half to four and one-half to a point below middle of eye; infralabials imbricating posteriorly, the last scale slightly enlarged and strongly keeled.

Mental pentagonal, with a labial border slightly more than one-half that of rostral; a series of postmentals on each side, about four or five in each series, the anterior scale of one series in contact with its fellow on the other side; a series of labiomentals between postmentals and infralabials, terminating usually between first infralabial and first postmental (occasionally at posterior border of first postmental); anterior gular scales with a single, apical notch, posterior gular scales with two apical notches; posterior gulars somewhat smaller than scales in adjacent areas.

Three or four auricular lobules, pointed, smooth, smaller than preceding scales; scales in temporal region keeled, not or weakly mucronate, somewhat larger than scales between ear and lateral nuchal pocket; these keeled, mucronate, with a few lateral mucrones; a fold from nuchal pocket to lower edge of ear, surmounted by enlarged, strongly keeled scales; scales between nuchal pocket and arm, and scales above arm, minute.

Dorsal scales keeled, rather strongly mucronate, weakly denticulate; usually ten or eleven longitudinal dorsal rows of scales at nape; the scales of the outer row on each side more strongly keeled; usually eight or nine rows at rump; dorsal scales 36 to 47 from occiput to base of tail, average 42.7; scales in axilla and at anterior margin of insertion of hind leg small, imbricating, median lateral scales larger, keeled, mucronate, weakly denticulate, about one-half or two-thirds

size of dorsal scales; ventral abdominal and chest scales smooth, with one or two apical notches; preanal scales entire, about equal in size to gular scales, smaller than abdominal scales; latter slightly smaller than scales on chest.

Dorsal scales of foreleg keeled, mucronate, not or weakly denticulate, about two-thirds size of median dorsal scales on body, somewhat smaller distally; scales on ventral surface of lower foreleg about two-thirds the size of dorsal scales of same member, keeled toward hand, smooth elsewhere; ventral scales of upper foreleg smooth, about one-third or one-fourth size of ventrals on lower foreleg; lamellar formula for fingers 8–11–16–15–10 (8–11–16–15–11).

Dorsal scales on shank nearly as large as dorsals on body, and of the same general character; dorsals on thigh somewhat smaller than those on shank; scales on thigh becoming smaller and smooth toward anterior and ventral surfaces; scales on posterior surface of thigh very small (almost granular), smooth; scales on posterior and posteroventral surface of shank smooth, those on anteroventral surfaces keeled; lamellar formula for toes 8–12–17–20–14 (8–12–16–20–15); postfemoral dermal pocket present; dorsal scales on tail slightly larger than dorsals on body, more strongly keeled and mucronate; subcaudals smooth toward base of tail, weakly keeled distally, pointed, notched (in males); subcaudals weakly keeled at base of tail in females; enlarged postanals present in males.

Color.—General ground color reddish-brown (males) to tawny-olive (females); a pigmented dorsolateral light line on each side, one and two half scale rows wide, more distinct in males than in females, originating at posterior margin of orbit and terminating on tail; a series of about ten black spots in females, reddish-brown in males, on each side of body between dorsolateral light lines; an indistinct median light line extending from occiput to tail; a narrow light line extending from labial region through ear to a point above arm, where it meets a vertical light line originating on arm and extending to dorsolateral light line; a black area in axilla, extending dorsally to the dorsolateral light line, and anteriorly to vertical light line from arm; a dark spot on shoulder below light line from labial region; a dark band extending from temporal region above ear, interrupted by the vertical light line from arm, and continuing to base of tail (darker in males); dorsal surface of hind legs and posterior surface of lower foreleg with very distinct dark bands; bands on shank much more distinct and regular than those on thigh.

Males with blue-bordered, pink or lavender areas on sides of abdomen; a narrow cream-colored line down middle of belly; chest and gular region vaguely mottled, irregular. Females occasionally with the chest mottled. Lower labial region in either sex may have narrow light bands.

Ruthven (1912a, pp. 319–320) describes live specimens from southern Vera Cruz as follows: "In life the ground color above is dull brownish-olive, the lateral stripes dull orange-yellow, the median stripe pale brownish-olive, and the light margin of the shoulder spot light orange or orange-yellow. As is well known, the stripes and dorsal spots vary in distinctness, but they are present in all of our material (47 specimens), even in the largest males. The red spots on the abdomen of the males are always very pale and the blue borders are likewise pale. I find no account in the literature of the fact that the adult females generally have the lips, sides of the neck, and more or less of the sides of the head bright orange-red. This color is not present in the young, is only occasionally indicated in the males, and is absent in some of the adult females, but it is present in nearly all of the latter. It disappears rapidly in alcohol, and probably seldom persists in specimens that have been preserved for any considerable length of time."

Variation.—The dorsal scales vary between 36 and 47 (36, one; 38, three; 39, two; 40, five; 41, twelve; 42, twelve; 43, fourteen; 44, twenty-two; 45, twenty-four; 46, four; 47, four). Ventral scales 50 to 67, average 58.9 (26 specimens); scales around body 39 to 55, average 48.2 (26 specimens); femoral pores 9 to 15, average 12.1 (9, one; 10, six; 11, twenty-four; 12 twenty-two; 13 nineteen; 14, thirteen; 15, two); rows of dorsals at nape 9 to 13 (9, one; 10, thirty-four; 11, thirty-five; 12, fourteen; 13, one); rows at middle of body 9 to 13 (9, one; 10, twenty-five; 11, forty-eight; 12, thirteen; 13, one); rows at rump seven to ten (7, two; 8, forty-one; 9, forty-five; 10, one).

Variation in scutellation of the head has been recorded in 92 specimens. Parietals one to three (1, thirty-one; 2, one hundred and twenty-one; 3, twelve); frontoparietals one to three (1, four; 2, one hundred and sixty-nine; 3, nine); frontal touches interparietal in three; frontoparietals contact medially in 87; an azygous scale never separates frontoparietals medially; anterior section of frontal longitudinally divided in all but one; posterior section of frontal longitudinally divided in five, transversely divided in three; supraoculars four to six (4, five; 5, one hundred and sixty-two; 6, seventeen); one or

more supraoculars in contact with median head scales in ten; prefrontals in contact in four, separated medially by an azygous scale in 85; median frontonasal reduced in size and separated from lateral frontonasals by a single small scale on each side; nasal separated from rostral in all; subnasal absent in 81, present on one side in 22, on both sides in 25 (129 specimens); first canthal in contact with lorilabials on one side in 10, on both sides in 58, separated in 24; preocular entire on one side in 5, on both sides in 8, divided in 79; postrostrals usually four, rarely two or three; loreals one to three, the numbers occurring with approximately equal frequency.

The specimens from Guatemala and British Honduras have a slightly lower average number of femoral pores, showing a minimum number of 9, maximum 13; specimens from Vera Cruz and Oaxaca have a minimum of 11, maximum of 13. The percentage of specimens included in the overlap of variation from the two general areas is too great to permit recognition of two subspecies.

Habits and habitat.—Based on observations made in southern Vera Cruz, Ruthven (1912) records that this species seems to prefer the more open habitats. It is generally associated with *Ameiva undulata* in the thickets on the savannah, in the more open places along the rivers, and in artificial clearings. It is often found in still more open places, where *A. undulata* never appears. It was not observed by Ruthven in the dense woods where *A. undulata* is occasionally found. He regards its natural habitat as the margins of the jungle.

Stuart (1935, p. 45) gives further data from observations in Petén, Guatemala: "[*S. teapensis*] appears to be a species common to both the high bush and the savannas. Superficially it is very similar to *Sceloporus chrysostictus* both in form and habits but is much more plastic than the latter. Along the shores of Laguna Petén at Ramate it was found in considerable numbers in the open, cleared areas. At Zotz it was abundant in the village clearing, and at La Libertad it was found on the open savanna, wooded islands, and *acahual*, and within the larger areas of bush. While the *acahual* and forest margin seem to be the most favored habitat, it is plastic enough to range in both directions from this optimum. Like *S. chrysostictus* it is a ground form, though occasionally it may be found on the lower branches of small bushes."

In Campeche, I found the species in only one locality, restricted to a relatively open banana patch. It apparently is rare in this

region, as the species was found in no other locality in Campeche, despite extended search in seemingly favorable localities.

Locality records.—VERA CRUZ: Cuatotolapam (UMMZ 41505–13, 41515, 41517–32, 41536, 41538–47, 41549–51, 41692–4; MCZ 8259–61); Lake Catemaco (UMMZ 41533–5, 41537); Catemaco (USNM 47303); Coatzacoalcos (Puerto Mexico) (USNM 47524); Tuxtla Volcano (USNM 46905); San Andrés Tuxtla (EHT 4944–54, 4907–22); Rodriguez Clara (EHT 5159–63); Achotal (FMNH 1476 [11]). OAXACA: Totontepec (USNM 46676, 47373); Santo Domingo (USNM 47334); Mts. near Santo Domingo (USNM 47332–3, 47339); Güichicovi (USNM 47338); Sarabia (Boulenger, 1897). CHIAPAS: Yajalon (USNM 47515); Ocuilapa (USNM 47550–1). CAMPECHE: Tres Brazos (EHT 9972–81). TABASCO: Teapa (USNM 46668–71).

GUATEMALA: Ramate (USNM 71408; UMMZ 74970[9], 74978 [2]); La Libertad (UMMZ 74971–4, 74976 [2], 74977); Zotz (UMMZ 74975 [16]); shore of Lake Petén, SE of Flores (UMMZ 79073); Sepacuite (UMMZ 67691 [6]); Secanquim (MCZ 28165–75); Chimozan, 1,500 feet (MCZ 28188–92); Coban (FMNH 21004); Petén (USNM 71842–63); (?)Rio Polochic (Bocourt, 1874); (?)Campur (Boettger, 1893).

BRITISH HONDURAS: San Agustin (UMMZ 15 spec.); 12 mi. S of Cayo (UMMZ 70423–4).

Sceloporus variabilis variabilis Wiegmann.

Sceloporus variabilis Wiegmann, Herp. Mex., p. 51, 1834; Gravenhorst, Nova Acta Acad. Leop., **18**, p. 766, 1837; Fitzinger, Syst. Rept., **1**, p. 75, 1843; Hallowell, U. S. Pac. R. R. Explor. Surv., **10**, Lieut. Williamson's Rept., p. 6, 1859; Müller, Reisen Ver. Staaten, Canada, Mex., **3**, p. 602, 1865; Cope, Proc. Amer. Phil. Soc., **11**, p. 161, 1869; Sumichrast, Bibl. Univ. Rev. Suisse, **46**, p. 243, 1873; Bocourt, Ann. Sci. Nat. Zool., (5), **17**, No. 10, p. 2, 1873; idem, Miss. Sci. Mex., Zool., **3**, sec. 1, pp. 200–202, pl. 18bis, figs. 1, 1 *a*, 1 *b*, pl. 19, fig. 2, 1874 (part?); Dugès, Naturaleza, **4**, p. 30, 1877; Sumichrast, Bull. Soc. Zool. France, **5**, p. 163, 1880 (part); idem, Naturaleza, **6**, p. 38, 1882 (part); Cope, Proc. Amer. Phil. Soc., **22**, p. 169, 1885 (part); idem, pp. 379, 397, 1885 (part); Boulenger, Cat. Liz. Brit. Mus., **2**, pp. 218, 236–237, 1885 (part); Ferrari-Perez, Proc. U. S. Nat. Mus., **9**, p. 193, 1886; Cope, Bull. U. S. Nat. Mus., **32**, p. 36, 1887 (part); Günther, Biol. Cent.-Amer., Rept. Batr., p. 75, 1890 (part); Stejneger, Proc. U. S. Nat. Mus., **14**, pp. 485–488, 1891 (part); Ives, Proc. Acad. Nat. Sci. Phila., **1891**, p. 462, 1892; Blatchley, Proc. U. S. Nat. Mus., **16**, p. 40, 1893; (?)Stejneger, N. Amer. Fauna, **7**, p. 178, 1893; Herrera, Cat. Rept. Mus. Nac., Mex., p. 18, 1895; Cope, Amer. Nat., **30**, p. 1022, 1896; Dugès, Naturaleza, (2), **2**, p. 479, 1896; Boulenger, Proc. Zool. Soc. Lond., **1897**, pp. 516–518, 1897 (part); McLain, Contrib. Neotrop. Herp., p. 3,

1899; Herrera, Cat. Rept. Mus. Nac., Mex., 2nd ed., p. 18, 1904; Stejneger, Proc. Biol. Soc. Wash., **17**, pp. 17, 19, 1904; Gadow, Proc. Zool. Soc. Lond., **2**, pp. 195, 214, 231, 232, 1905 (part); idem, Zool. Jahrb., Syst., **29**, p. 706, 1910; Ruthven, Rept. Mich. Acad. Sci., **14**, p. 231, 1912 (part); Flower, Vert. Animals Zool. Soc. Lond., **3**, p. 243, 1929; Gadow, Jorullo, p. 66, 1930; Smith, Proc. Biol. Soc. Wash., **47**, p. 121, 1934; Dunn, Proc. Acad. Nat. Sci. Phila., **88**, pp. 473, 474, 1936.

Tropidolepis variabilis Duméril and Bibron, Erp. Gén., **4**, pp. 308–309, 1837; Gray, Cat. Liz. Brit. Mus., pp. 209–210, 1845; Duméril and Duméril, Cat. Méth., p. 77, 1851; Lichtenstein, Nomen. Rept. Amph., p. 9, 1856; Jan, Cenni Rept. Mus. Milano, p. 39, 1857; Westphal-Castelnau, Congr. Cient. France, **35**, p. 285, 1872.

Sceloporus variabilis variabilis Smith, Proc. Biol. Soc. Wash., **47**, pp. 127–129, 1934; idem, Occ. Papers Mus. Zool. Univ. Mich., **358**, pp. 9–10, 1937. It seems of importance to cite other references to *variabilis* which, in my opinion, are based upon specimens of other species or subspecies of *Sceloporus*.

Tropidolepis variabilis Dugès, Naturaleza, **1**, p. 143, 1870—Guadalajara (= *utiformis?*).

Sceloporus variabilis Sumichrast, Bull. Soc. Zool. France, **5**, p. 163, 1880 (=*v. smithi*); idem, Naturaleza, **5**, p. 280, 1881 (=*v. smithi*); Cope, Proc. Amer. Phil. Soc., **23**, p. 283, 1886 (=*v. marmoratus*); Boulenger, Cat. Liz. Brit. Mus., **3**, p. 503, 1887 (=*v. marmoratus*); Cope, Proc. U. S. Nat. Mus., **11**, p. 397, 1888 (=*v. marmoratus*); Ives, Proc. Acad. Nat. Sci. Phila., 1891, p. 459, 1892 (=*cozumelae*); (?)Boettger, Kat. Rept. Senck. Mus., p. 65, 1893 (=*v. olloporus*); Cope, Ann. Rept. U. S. Nat. Mus., **1898**, pp. 398–401, fig. 67, 1900 (=*v. marmoratus*); Brown, Proc. Acad. Nat. Sci. Phila., **55**, p. 552, 1903 (=*v. marmoratus*); Werner, Abh. Bayer. Akad. Wiss., Math.-Phys. Kl., **22**, Abt. 2, p. 344, 1903 (=*v. olloporus?*); Barbour and Cole, Bull. Mus. Comp. Zool., **50**, No. 5, p. 150, 1906 (=*cozumelae* and *chrysostictus*); Ditmars, Rept. Book, pp. 130, 137, 1907 (=*v. marmoratus*); Ruthven, Zool. Jahrb., Syst., **32**, pp. 300, 301, 302, 319–320, 1912 (=*teapensis*); Strecker, Baylor Bull., **18**, No. 4, p. 22, 1915 (=*v. marmoratus*); Stejneger and Barbour, Check List N. Amer. Amph. Rept., p. 57, 1917 (=*v. marmoratus*); Strecker, Bull. Sci. Soc. San Antonio, **4**, pp. 19–20, 1922 (=*v. marmoratus*); Stejneger and Barbour, Check List N. Amer. Amph. Rept., 2nd ed., p. 59, 1923 (=*v. marmoratus*); Strecker and Williams, Contrib. Baylor Univ. Mus., **12**, p. 14, 1927 (=*v. marmoratus*); Wright and Wright, Proc. Biol. Soc. Wash., **40**, p. 57, 1927 (=*v. marmoratus*); Schmidt, Field Mus. Nat. Hist., Zool. Ser., **12**, p. 193, 1928 (=*v. olloporus*); Dunn and Emlen, Proc. Acad. Nat. Sci. Phila., **84**, p. 28, 1932 (=*v. olloporus*); Stejneger and Barbour, Check List N. Amer. Amph. Rept., 3rd ed., p. 65, 1933 (=*v. marmoratus*); Strecker, Copeia, **1933**, p. 78, 1933 (=*v. marmoratus*); Stuart, Occ. Papers Mus. Zool. Univ. Mich., **292**, p. 11, 1934 (=*teapensis*); idem, Misc. Publ. Mus. Zool. Univ. Mich., **20**, pp. 8, 21, 26, 30, 31, 33, 1935 (=*teapensis*); Burt, Trans. Amer. Micr. Soc., **54**, p. 174, 1935 (=*v. olloporus*); Strecker and Johnson, Baylor Bull., **38**, No. 3, pp. 19, 20–21, 1935 (=*v. marmoratus*); Ditmars, Rept. N. Amer., pp. 48, 55, 1936 (=*v. marmoratus*).

Type locality.—Mexico.

Distribution.—Southern Tamaulipas (near Llera), along the Atlantic coast to south central Vera Cruz (Rio Blanco), inland to eastern Queretaro and Puebla; through southern Oaxaca to extreme western Guatemala, reaching the Pacific coast only in Chiapas.

FIG. 45. Distribution of *Sceloporus variabilis: S. v. variabilis*, ○; *S. v. marmoratus*, △; *S. v. smithi*, □; *S. v. olloporus*, ▽.

Status.—The determination of the identity of *Sceloporus variabilis* is made difficult by the later discovery of the several related forms, *v. marmoratus, v. olloporus, v. smithi, teapensis,* and *cozumelae.* That the name does not refer to *v. marmoratus* or *cozumelae* is indicated by the large snout-vent measurement of Wiegmann's specimens (2.75 inches in the male). *S. v. smithi* is excluded, as the stripes are stated to be sometimes obsolete, and the rows of

dorsals continuing onto the base of the tail are stated to be seven or eight. But it is more difficult to determine whether or not *teapensis* or *v. olloporus* may be involved.

A free translation of Wiegmann's original description follows.

"Above ashy-olivaceous, unicolor in the case of the male, with whitish lateral stripes; dark transverse spots biseriate in the middle of the back in the female; head unicolor; superciliary region with transverse scales, outer region with small scales; median dorsal scales acuminate-rhomboidal, twice larger than the lateral scales.

"Scutes of the head carinate rugose, varying in position and number. Eight to nine subpolygonal scales occupy the frontal disk. Primary frontal double with three prefrontals. Outer superciliary region with small scales, inner region covered by transverse, oblong-polygonal scales, the three middle ones very large. Scales of the middle of the back acuminate-rhomboidal, strongly mucronate, sometimes with a few denticles near the tip, their keels forming fourteen continuous longitudinal lines on the back; laterals abruptly twice smaller than dorsals, rhomboid-ovate, subtricuspid, their continuous carinae forming lines ascending obliquely upward. Seven to eight of the dorsal carinae continue on the base of the tail. Head uniformly olivaceous, without marks or spots. Color of males ashy-olivaceous above, a pale longitudinal stripe on each side changing from whitish to yellowish, extending to the base of the tail from the eye; sides generally dark ashy; spots on the back reduced or absent. Color of the breast whitish, often variegated with a pale ashy color, the color merging into longitudinal stripes running through the middle of the belly, and on each side with a margin of bright blue; the throat of the adults gray-blue, the tail generally unicolor, olivaceous. Females always smaller than the males, above ashy-fuscous, or fuscous olivaceous. Dorsal spots dark fuscous, often margined with white on both sides, rarely evanescent. Lateral stripes less conspicuous than in the males, greenish, frequently obsolete posteriorly, sometimes lacking anteriorly; abdomen becoming a bluish-white; tail banded with fuscous.

"Length of the body 2.75 inches, tail 4 inches (male), length of body 2.25 inches, tail 3.25 inches (female)."

S. teapensis apparently never has fourteen rows of dorsal scales at the middle of the body. One specimen (of 89) counted has thirteen, and the remainder have twelve or less. Fourteen dorsal rows is well within the range of variation of *variabilis* of other authors. However, *variabilis* only exceptionally has strongly mucronate and

denticulate dorsal scales; this condition is more typical of *teapensis*. The males, according to the description, are not distinctly spotted, while in *teapensis* the spotted pattern is usual.

These are the only characters mentioned by Wiegmann which may be of value in determining to which of these two forms his name should apply. Bocourt (1874) figures the head of the type of *variabilis*, and shows a subnasal, which usually does not occur in *teapensis*. *Sceloporus variabilis olloporus* is excluded from consideration since it is not Mexican. Wiegmann's description thus appears to be applicable to the race of central and northern Vera Cruz.

Diagnosis.—A *Sceloporus* of moderate size, maximum snout-vent measurement 74 mm.; a postfemoral dermal pocket present; dorsal scales usually between 49 and 59 from occiput to base of tail, average 54.5; lateral scales one-half to two-thirds size of dorsal scales, somewhat smaller than ventral scales; scales around body 58 to 70; ventral scales 57 to 79, average 67.6; femoral pores usually twelve to fourteen (average 12.8), the two series widely separated medially; subnasal rarely absent; frontoparietals generally in contact medially; anterior section of frontal rarely not longitudinally divided; prefrontals usually separated medially by an azygous scale; median frontonasal frequently separated from lateral frontonasals, or irregularly divided; preocular rarely entire. Two dorsolateral light lines present; a series of indistinct dark spots on back, one row on each side of mid-dorsal line (spots sometimes very faint or absent); limbs not strongly banded (except posterior surface of lower foreleg); males with pink, blue-bordered areas on sides of belly.

Description.—Dorsal head scales rugose; interparietal large, two-thirds size of supraorbital area; parietals usually two on each side, the anterior much the larger; frontoparietals often in contact medially, rarely separated by contact of frontal with interparietal, occasionally by an azygous scale; frontoparietals usually two on each side, occasionally one or three; anterior section of frontal usually divided, posterior section usually entire; supraoculars three to seven on each side, generally five; a row of small scales between supraoculars and median head scales, occasionally incomplete; frequently two incomplete rows of scales between supraoculars and superciliaries; usually six superciliaries visible from above; prefrontals rarely not separated medially by an azygous scale; median frontonasal usually separated from lateral frontonasals, or irregularly divided; lateral frontonasals normal, in contact with canthals;

internasals irregular; a row usually of four small scales posterior to rostral; subnasal seldom absent; first canthal subequal in size to second canthal, or slightly larger, frequently in contact with lorilabial scales; preocular rarely entire, upper section keeled; subocular large, strongly keeled; usually two rather strongly keeled postoculars; one row of lorilabial scales, occasionally with another incomplete series added; lorilabials usually weakly keeled; three and one-half to four supralabials and three infralabials to a point below middle of eye.

Mental pentagonal, with a labial border somewhat less than two-thirds that of rostral; a series of four or five postmentals posterior to mental, the first scales in contact medially; outer row of labiomentals extending anteriorly to between posterior parts of first postmental and first infralabial; extreme posterior gular scales weakly notched; lateral gular scales near angle of jaws somewhat reduced in size; scales down middle of throat somewhat smaller than adjacent scales.

Auricular lobules variable, not much, if any, larger than preceding scales; temporal scales keeled, not mucronate, slightly smaller than scales between ear and nuchal pocket; latter scales keeled, mucronate; a fold from lower edge of nuchal pocket to lower edge of ear, surmounted by slightly enlarged, strongly mucronate scales; another fold from upper edge of nuchal fold to a point above insertion of foreleg; scales above insertion of foreleg granular, smaller than axillary scales, continuous with scales in lateral nuchal pocket.

Dorsal scales keeled, mucronate, not denticulate, in twelve to sixteen rows at nape, nine to eleven at rump; lateral scales about one-half size of dorsal scales, slightly smaller than ventral scales; latter with a single apical notch, or entire; ventral scales on chest slightly larger than other ventral scales; preanal scales slightly smaller than ventral abdominal scales; interfemoral scales reduced somewhat in size.

Dorsal scales of foreleg keeled, mucronate, those on upper foreleg slightly larger than those on lower foreleg, about three-fifths size of median dorsals on body; median ventral scales on lower foreleg about three-fifths size of dorsal scales of same member; scales on posterior and posteroventral surfaces of lower foreleg and near hand keeled; scales on anterior and anteroventral surfaces of lower foreleg smooth; ventral scales on upper foreleg smooth, very small toward axilla, increasing in size toward lower foreleg and merging with the scales of the latter; lamellar formula for fingers 9–13–16–17–12 (9–14–17–17–11).

Dorsal scales of thigh about four-fifths size of dorsal scales on body, similar in character; ventral scales of thigh smooth, decreasing in size toward femoral pore series; scales on posterior surface of thigh very minute, smooth, slightly increasing in size toward femoral pore series; dorsal scales on shank very slightly smaller than or subequal in size to dorsal scales on body, strongly keeled, strongly mucronate; ventral scales of shank smooth, about two-thirds size of dorsals of same member; scales on anterior surface of shank keeled, about two-fifths size of dorsals of same member; scales in ankle very minute; lamellar formula for toes 9–13–17–24–15 (9–12–18–22–16).

Dorsal scales on tail strongly keeled, very strongly mucronate, about one and one-half times as large as dorsal scales on body; subcaudals on proximal third or fourth of tail smooth in males; all subcaudal scales weakly keeled and mucronate in females; a postfemoral dermal pocket present; enlarged postanals present in males.

Color.—General ground color approximately auburn (males) to gray-brown (females); a dorsolateral light line down each side of back, about one and two half scale rows wide, originating at posterior margin of orbit and terminating on tail; a series of about eleven dark spots on each side between these light lines, each spot sometimes with a light posterior border; a narrow lighter band down middle of back sometimes evident (more evident in females); limbs very dark, the hind limbs with faint dark and light brown bands; posterior surface of lower foreleg with very distinct bands; posterior surface of thigh usually with irregular dark-outlined light spots; males with sides of body dark brown, or with a broad brown band, mottled below; a black spot in axilla, coincident with dark blue border of pink abdominal areas in males, extending over shoulder a short distance in front of arm, divided by a broad white band extending obliquely upward from arm; shoulder dark spot usually poorly defined in females, not well defined in males in front of arm; a short light line extending from labial region to ear.

Males with chest, gular region and ventral surface of limbs, middle of abdominal and preanal region mottled with dark gray on a cream ground color; sides of abdomen pink with a dark blue border, the border narrower medially than anteriorly and posteriorly. Throat with a pinkish hue, and a short median longitudinal light line posteriorly (this coloration more evident in northern specimens; the throat tends to be more strongly clouded with gray in southern specimens).

Females usually uniform cream color below, with a faint gray mottling in gular region. In occasional females the lateral abdominal marks of males are faintly evident. In alcohol the head appears to be faintly suffused with orange.

Variation.—The variation of the scutellation of the head has been recorded in 200 specimens, as follows: parietals one to three (1, one hundred and fifty-five; 2, two hundred and nineteen; 3, eight); frontoparietals one to four on each side (1, eight; 2, three hundred and fifty; 3, thirty-seven); frontoparietals contact medially in 187; frontal contact interparietal in eight; an azygous scale separates frontoparietals medially in five; posterior section of frontal divided longitudinally in one, transversely in three, into three sections in one; anterior section of frontal divided in all; two supraoculars divided on both sides in one specimen; number of supraoculars three to seven (3, one; 4, three; 5, three hundred and forty-two; 6, forty-seven; 7, two); prefrontals in contact medially in two; frontal contacts frontonasal in none; an azygous scale between prefrontals in 198; median frontonasal irregular in 58, separated from both lateral frontonasals in 118, from one lateral frontonasal in six, normal in five (the percentage of specimens having an irregular median frontonasal is highest in those from Tonalá, Chiapas); the subnasal is absent on one side in four, on both sides in six; two subnasals on one side in one; subnasal obviously fused with first canthal in one; two canthals in all; first canthal in contact with lorilabials on both sides in 22, on one side in 25; preocular entire on one side in one, on both sides in four; postrostrals two to five (2, three; 3, thirteen; 4, one hundred and seventy-two; 5, three); loreals one to five (1, forty-two; 2 seventy-five; 3, one hundred and eighty-nine; 4, fifty-nine; 5, one); loreal fused with first canthal in one specimen.

The scales from occiput to base of tail in 197 specimens counted vary between 49 and 68, occurring with the following frequency: 49, eight; 50, seven; 51, ten; 52, twelve; 53, seventeen; 54, seventeen; 55, twenty-five; 56, nineteen; 57, twenty-five; 58, eighteen; 59, eleven; 60, thirteen; 61, six; 62, three; 63, one; 64, two; 65, two; 68, one (average, 55.2). Among these specimens are those in the periphery of the range of *v. variabilis*, where variants occur very frequently, due to intergrading populations. Specimens labeled "Tehuantepec" (Sumichrast, USNM) are probably from the district. They have dorsal scale counts of 59, 60, 61, and 53 (other specimens from Tehuantepec are typical *v. smithi*); specimens from Tonalá, Chiapas (EHT, 22 spec.), have an average count of 58.4 (minimum

55; maximum 63). These higher scale counts may be expected, as both these localities are very near the area occupied by *v. smithi*, which has smaller dorsal scales than the average *v. variabilis*. The only other specimens which differ by average count from the average for the whole series are a series of three from Jalpán, Querétaro (USNM 47777–9), and another series from La Placita, 8 km. beyond Jacala, Hidalgo (EHT 7780A, 7780–7, 7789). The average number of dorsals for these specimens is 61.4 (maximum 68; minimum 57). It would appear that another race of *variabilis*, in this region, may prove to be distinguishable.

The scales around the body in 90 specimens vary between 52 and 77, averaging 65.7 (52, one; 55, two; 56, four; 57, five; 58, two; 59, five; 60, four; 61, eight; 62, seven; 63, three; 64, six; 65, nine; 66, five; 67, four; 68, two; 69, ten; 70, three; 71, one; 72, three; 73, two; 75, three; 76, one; 77, one).

The ventral scales vary between 57 and 79, averaging 67.6 (57, one; 58, one; 60, four; 61, two; 62, four; 63, four; 64, eight; 65, seven; 66, five; 67, nine; 68, four; 69, seven; 70, seven; 71, eight; 72, seven; 73, two; 74, one; 75, three; 77, two; 78, one; 79, one).

The femoral pores vary from 9 to 18 (9, two; 10, six; 11, thirty-four; 12, eighty-four; 13, one hundred; 14, sixty; 15, twenty; 16, two; 17, two; 18, one). The count of nine occurs on one side in two specimens, one from Ocozucuautla, Chiapas (9–11), the other from Santa Caterina, Puebla (9–10). The count of ten occurs in one from Puebla (given above), three from localities near the city of Vera Cruz (10–10, 10–11, 10–11), and one from Ocozucuautla (10–11). The counts of 16, 17, and 18 are found only in specimens from La Placita, Hidalgo (15–16), four miles north of Antiguo Morelos, Tamaulipas (17–18, 16–?) and 26 kilometers north of El Limón, Tamaulipas (15–17). The average count for the entire series is 12.8.

It appears that specimens from lower altitudes may average larger in size than those from higher altitudes. Among 23 specimens from Tonala, Chiapas, on the coastal plain, seven measure more than 65 mm.; in a series of fourteen from Tuxtla Gutierrez, Asunción, and Ocozucuautla, all on the high plateau of Chiapas, the largest measure 63.8 mm. from snout to vent. The following list of specimens measuring 65 mm. or over may be of interest: 26 km. S of El Limón, Tamaulipas (65.7); Altamira, Tamaulipas (65, 66); 4 mi. N of Antiguo Morelos, Tamaulipas (67); La Placita, Hidalgo (65.8); Huauchinango, Puebla (65, 67.4, 69.8, 70.5, 74); Potrero Viejo, Vera Cruz (66, 70.2); Dos Rios, or Encero, Vera Cruz (70);

Qualtlapan, near Orizaba (70.5); below Cordoba, Vera Cruz (67.3); near city of Vera Cruz (65.1, 65.4, 68.6); Tuxtepec, Oaxaca (69.5); Tehuantepec, Oaxaca (district) (70); Tonalá, Chiapas (65.6, 68, 68.7, 69, 70, 70, 71.2, 73.6).

Habits and habitat.—Despite the fact that *v. variabilis* has been collected in a large number of localities by many collectors, little has been published concerning its habits. Blatchley (1893, p. 40) states: "Frequent at Orizaba and as high as 14,000 feet on the mountain. About the city it was most often seen on the stone walls surrounding the gardens, especially in the suburbs."

The species appears to be oviparous. The smallest specimen examined measures 22.6 mm. snout to vent, and still has the embryonic membranes attached to the umbilical cord; it was collected six miles north of Valles, San Luis Potosí, June 29, 1936.

I have found the subspecies to be common along the road in southern Tamaulipas, basking and scurrying about in the sun in exposed areas. Relatively open areas and a humid climate are apparently requisite. These lizards are usually easily approached and collected. Their noisy movements often betray their presence.

Locality records.—TAMAULIPAS: 23 km. S of Llera (EHT 7769–70); 26 km. N of El Limón (EHT 7771A, 7771–2); 10 mi. N of Limón (EHT 7753–61); Hda. La Clementina, 3 mi. W of Forlón (EHT 7762, 7764–5); 4 mi. N of Antiguo Morelos (EHT 7823–4); 6 mi. S of Antiguo Morelos (EHT 7701–7714, 7788); Altamira (USNM 47347–51, 46785–9); Chocoy (MCZ 17492); Manuel (MCZ 17491); Tampico (LSJU 3625–30). SAN LUIS POTOSÍ: 6 mi. N of Valles (EHT 7772A, 7773–6); 5 mi. S of Valles (EHT 7715–21, 7725–30); near Palitla, 9 km. from Tamazunchale (EHT 7777A, 7777–9); Tamazunchale (WM 1 spec.); Jilitla (USNM 47818); Ebano (MCZ 17499–506). QUERÉTARO: Jalpan (USNM 47777–9). GUANAJUATO: (?)Huaxteca Potosina (Dugès, 1896). HIDALGO: La Placita, 8 km. beyond Jacala (EHT 7780A, 7780–7, 7789); 4 mi. S of Jacala (EHT 7722–4). PUEBLA: Santa Caterina (AMNH 18853–61); near Zapotitlán (EHT 7752); Huauchinango (USNM 47819–21, 47866–7); Mutallaynca (Metlaltoyuca?) (USNM 47829); Villa Juarez (UMMZ 63936); Tlapanalá (Izucar de Matamoros) (Ferrari Perez, 1886). VERA CRUZ: (ANSP 12565); near Vera Cruz (AMNH 18457; MCZ 16058–62; CAS 73190–241); Panteon Viejo, swamp 1 mi. S of Vera Cruz (AMNH 18937–8); 2 mi. W of Vera Cruz (AMNH 15698); Laguna de Coyul, 4 mi. S of Vera Cruz (AMNH 18431–3); 15 mi. W of Vera Cruz (EHT 7836); 1½–2 mi. E of

Acultzingo (EHT 7751); K 66 on RR to Boca del Rio (AMNH 18461–4); below Cordoba (EHT 7793–8); Cordoba (USNM 19017–8); Carrizal (USNM 47632–6); Chichicaxtle (USNM 46818); Chichi (USNM 46648); Cerro del Gallo (MCZ 16091–100); Dos Rios or Encero (EHT 7825–31); Huatuxco (Günther, 1890); Jalapa (EHT 7837; USNM 4790 [2], 6306 [3]; ANSP 8425–7, 8525, 8535–7, 8543, 12558; MCZ 2849, 15992–16002); 5 mi. E of Jalapa (EHT 7731); Jico (Xico) (USNM 46778; FMNH 1344; LSJU 3819–23); Jicaltepec (Cope, 1885); Pines near Las Vigas (EHT 7752A); La Antigua (FMNH 1491 [10]); La Perla (Gadow, 1905); La Raya (Gadow, 1905); Madenga, 20 mi. S of Vera Cruz (AMNH 18930–1, 18441–7); Mirador (USNM 25065–72, 46812–7); Motzorongo (FMNH 1258 [2]); Orizaba (USNM 46819–20, 30215–8, 6350 [3], 46649; ANSP 8523; LSJU 1969–70); Otopa (FMNH 1312 [3], 1311 [9]); Mt. Orizaba (MCZ 14154–5); Potrero Viejo (EHT 7799–7822); near El Potrero (UMMZ 67687 [5]; MCZ 28219–29); 5 mi. E of Paso de Ovejas (EHT 7832–5); Puente Nacional (EHT 7742–6); Perez (FMNH 1317 [8], 1319 [14], 1684 [10]); Panuco (MCZ 20037–46; SDSNH 16314); Presidio, near Motzorongo (MCZ 1092, 21094–21100); Qualtlapan, near Orizaba (EHT 7790–2); N of Rio Atoyac, near Potrero (AMNH 18458–60); Rio Blanco (FMNH 1327 [10]); Reventeredo (MCZ 19999); San Francisco (FMNH 1331 [10]); San Rafael (USNM 32137–42, 32150–9); Tezonapa (CAS 73273–417 [part]); Texolo (ANSP 15332, 15335–6); near Totalco (EHT 7750); Tierra Colorada (EHT 7747–9, 7731A, 7732–41). OAXACA: Tehuantepec (district) (USNM 30136–9); (?)Agua Fria (Gadow, 1905); Tuxtepec (USNM 46911–3); Niltepec (FMNH 1468); El Hule (FMNH 1268 [2]); Tapanatepec (MCZ 33454–5); Cosalapa (CAS 73242–72); Tetela (Gadow, 1905); Tezonapa (CAS 73273–417 [part]). CHIAPAS: Tonalá (EHT 7838–60; USNM 47804); Ocozucoautla (EHT 7861–9; USNM 47549); Tuxtla Gutiérrez (EHT 7873–4); Asunción (EHT 7870–2); San Bartolome (USNM 47502, 47276–9).

GUATEMALA: Jucatlenago (USNM 47511); Nenton (USNM 47518–20); Progreso (CAS 68377–88).[1]

Sceloporus variabilis marmoratus Hallowell.

Sceloporus marmoratus Hallowell, Proc. Acad. Nat. Sci. Phila., 6, p. 178, 1852; idem, in Sitgreaves, Rept. Exped. Zuni Colorado R., pp. 110–111, 114, pl. 2, 1854; Duméril, Arch. Mus. Hist. Nat. Paris, 8, p. 547, 1856; Baird, in Emory, U. S.-Mex. Bound. Surv., 2, pt. 2, No. [3], p. 6, 1859; Heerman,

[1] Excluded as due to erroneous identification: Chilpancingo (Gadow, 1905); Nevado de Colima, 7,000–6,000 feet (Gadow, 1905); Jalisco, N of Rio Santiago (Günther, 1890); Atoyac, Guerrero (Günther, 1890); Guadalajara (Dugès, 1870).

U. S. Pacif. R. R. Explor. Surv., **10**, Lieut. Williamson's Rept., p. 24, 1859; Bocourt, Miss. Sci. Mex., Zool., **3**, sec. 1, p. 202, 1874; Cope, Bull. U. S. Nat. Mus., **1**, pp. 48, 92, 1875; Coues, U. S. Geog. Surv. W. 100th Mer., **5**, p. 595, 1875; Dugès, Naturaleza, **4**, p. 30, 1877; Yarrow, Bull. U. S. Nat. Mus., **24**, pp. 58, 189, 1883; Yarrow, Smithson. Misc. Coll., **517**, p. 10, 1883; Garman, Bull. Essex Inst., **16**, p. 17, 1884; Boulenger, Cat. Liz. Brit. Mus., **2**, p. 216, 1885; Stejneger, Proc. U. S. Nat. Mus., **14**, pp. 485, 486, 1891; idem, N. Amer. Fauna, **7**, p. 178, 1893; Strecker, Baylor Bull., **18**, No. 4, p. 22, 1915; Smith, Proc. Biol. Soc. Wash., **47**, p. 121, 1934.

Sceloporus delicatissimus Hallowell, Proc. Acad. Nat. Sci. Phila., **6**, p. 178, 1852—San Antonio, Texas (type USNM 16020); Hallowell, in Sitgreaves, Rept. Exped. Zuni Colorado R., pp. 109–110, 144, pl. 1, 1854; Duméril, Arch. Mus. Hist. Nat. Paris, **8**, p. 547, 1856; Bocourt, in Duméril, Bocourt and Mocquard, Miss. Sci. Mex., Zool., **3**, sec. 1, p. 202, 1874; Dugès, Naturaleza, **4**, p. 30, 1877; Boulenger, Cat. Liz. Brit. Mus., **2**, p. 216, 1885; Stejneger, Proc. U. S. Nat. Mus., **14**, pp. 485, 486, 1891; Strecker, Baylor Bull., **18**, No. 4, p. 22, 1915.

Sceloporus variabilis(?) Hallowell, U. S. Pacif. R. R. Explor. Surv., **10**, Lieut. Williamson's Rept., p. 6, 1859; Cope, Proc. Amer. Phil. Soc., **22**, p. 169, 1885 (part); idem, p. 397, 1885 (part); idem, **23**, p. 283, 1886; Boulenger, Cat. Liz. Brit. Mus., **3**, p. 503, 1887; Cope, Bull. U. S. Nat. Mus., **32**, p. 36, 1887 (part); idem. Proc. U. S. Nat. Mus., **11**, p. 397, 1888; Günther, Biol. Cent.-Amer., Rept. Batr., p. 75, 1890 (part); Stejneger, Proc. U. S. Nat. Mus., **14**, pp. 485–488, 1891 (part); (?) idem, N. Amer. Fauna, **7**, p. 178, 1893; Boulenger, Proc. Zool. Soc. Lond., **1897**, pp. 516–518, 1897 (part); Cope, Ann. Rept. U. S. Nat. Mus., **1898**, pp. 398–401, 1900 (part); Brown, Proc. Acad. Nat. Sci. Phila., **55**, p. 552, 1903; (?)Stejneger, Proc. Biol. Soc. Wash., **17**, pp. 17, 19, 1904; Ditmars, Rept. Book, pp. 130, 137, 1907; Strecker, Baylor Bull., **18**, No. 4, p. 22, 1915; Stejneger and Barbour, Check List N. Amer. Amph. Rept., p. 57, 1917; Strecker, Bull. Sci. Soc. San Antonio, **4**, pp. 19–20, 1922; Stejneger and Barbour, Check List N. Amer. Amph. Rept., 2nd ed., p. 59, 1923; Strecker and Williams, Contrib. Baylor Univ. Mus., **12**, p. 14, 1927; Wright and Wright, Proc. Biol. Soc. Wash., **40**, p. 57, 1927; Strecker, Copeia, **1933**, p. 78, 1933; Stejneger and Barbour, Check List N. Amer. Amph. Rept., 3rd ed., p. 65, 1933; Strecker and Johnson, Baylor Bull., **38**, No. 3, pp. 19, 20–21, 1935; Ditmars, Rept. N. Amer., pp. 48, 55, 1936.

Sceloporus scalaris Cope, Bull. U. S. Nat. Mus., **17**, pp. 17, 44, 1880; Yarrow, Bull. U. S. Nat. Mus., **24**, pp. 62, 189, 1883; Yarrow, Smithson. Misc. Coll., **517**, p. 10, 1883; Cope, Proc. Amer. Phil. Soc., **22**, pp. 396–397, 1885 (part); Cope, Bull. U. S. Nat. Mus., **32**, p. 36, 1887 (part); Cope, Proc. U. S. Nat. Mus., **11**, p. 397, 1888; Brown, Proc. Acad. Nat. Sci. Phila., **55**, p. 552, 1903.

Sceloporus variabilis marmoratus Smith, Proc. Biol. Soc. Wash., **47**, pp. 125–128, 1934; Burt, Trans. Kans. Acad. Sci., **38**, pp. 276, 278, 279, 300, 305, fig. 63, 1936; idem, Papers Mich. Acad. Sci., **22**, pp. 534, 539–540, 1937; Gaige, Univ. Mich. Stud., Sci., **12**, pp. 302–303, 1937; Smith, Occ. Papers Mus. Zool. Univ. Mich., **358**, p. 10, 1937.

Type locality.—San Antonio, Texas. Type apparently lost.

Distribution.—Dallas, Texas, south to Ciudad Victoria, Tamaulipas, westward to El Paso (fig. 45).

Diagnosis.—A *Sceloporus* with rugose or keeled cephalic plates; frontoparietals usually in contact medially; anterior section of frontal longitudinally divided; prefrontals separated by an azygous scale; subnasal rarely absent; preocular usually divided; postrostrals usually four; femoral pores 10 to 14; postfemoral dermal pocket present; lateral scales smaller than either dorsals or ventrals, in oblique rows; 58 to 67 scales from occiput to base of tail (average 64.1); ventrals 65 to 70, average 67.9; scales around body 64 to 73, average 67.5; maximum snout-vent measurement 52.5 mm. Dorsolateral light stripes present; a series of dark spots on each side of back; character of dorsal markings not sexually dimorphic; adult males with a pink area on each side of belly, bordered by dark blue.

Description.—Dorsal head scales rugose; parietals one or two on each side, posterior scale smaller than anterior scale; frontoparietals usually in contact medially, generally two on each side; anterior section of frontal longitudinally divided; supraoculars four to six, usually five on each side; a row of small scales separating supraoculars from median head scales, rarely incomplete; two or three irregular rows of small scales between supraoculars and superciliaries; usually six superciliaries visible from above; prefrontals separated medially by one or rarely two small scales; median frontonasal divided irregularly into two to six scales, frequently four; lateral frontonasals normal, in contact with both canthals; internasals irregular, usually one pair of rather large scales, separated from nasal on each side by another elongate scale, and from rostral by a row of square scales; nasals separated from rostral; subnasal rarely absent; canthals subequal in size, the first rarely in contact with lorilabials; loreal irregular, usually divided; preocular usually divided, upper section strongly keeled; subocular large, strongly keeled, usually followed posteriorly by three strongly keeled postoculars; one row of lorilabials, with occasionally another incomplete row; lorilabials weakly keeled, imbricating anteriorly when in a single row; upper labials three and one-half to four and one-half to a point below middle of eye, usually imbricating anteriorly; infralabials about four to a point below middle of eye.

Mental pentagonal, with a labial border slightly more than one-half that of rostral; about four postmentals on each side behind mental, the first scales in contact medially; outer row of labiomentals

terminating anteriorly usually between posterior edge of first postmental and first infralabial (rarely continuous to mental); inner row of labiomentals terminating anteriorly below second infralabial; median and posterior gular scales with a single apical notch; scales immediately below ear and near angle of jaws reduced in size.

Auricular lobules variable, not much larger than preceding scales; temporal scales keeled, not mucronate, subequal in size to largest scales between ear and lateral nuchal pocket; two folds diverging from nuchal fold usually evident, one passing to lower edge of ear, the other passing to a point above insertion of foreleg, neither surmounted by enlarged scales; scales in axilla and above arm (to dorsal scales) very minute.

Dorsal scales weakly mucronate, keeled; fourteen to eighteen rows of dorsals at nape, ten to twelve rows at rump; lateral scales similar in character to dorsal scales, about two-thirds size of dorsal scales, and subequal to or slightly larger than median abdominal scales; axillary scales minute, merging gradually with lateral scales, smaller than the scales at anterior margin of insertion of hind leg; abdominal and chest scales with an apical notch; preanal scales entire.

Dorsal scales of foreleg keeled, mucronate, those on upper foreleg very slightly larger than those on lower foreleg, somewhat smaller than median dorsal scales on body; median ventral scales of lower foreleg about two-thirds size of dorsal scales of same member; scales on posteroventral surfaces of lower foreleg, and ventral scales near hand, keeled; scales on anteroventral surface of lower foreleg smooth; ventral scales of upper foreleg smooth, gradually increasing in size distally from axilla and merging with ventral scales of lower foreleg; lamellar formula for fingers 10–13–19–?–13 (10–15–19–19–13).

Dorsal scales of hind leg keeled, mucronate, those on shank subequal in size to median dorsals on body, those on anterodorsal surface of thigh slightly smaller; scales on thigh smooth on anterior surface, becoming smaller toward femoral pore series; scales on posterior surface of thigh granular, somewhat larger near femoral pore series; scales on ventral, anterior, and posterior surfaces of shank about two-thirds size of dorsals of same member, the ventral scales keeled; lamellar formula for toes 9–13–22–27–17 (10–14–21–25–18).

Dorsal caudal scales (near base of tail) one and one-half times as large as dorsals on body, strongly keeled, strongly mucronate; subcaudals on proximal one-third of tail smooth and with an apical

notch (males); females with all subcaudals keeled and mucronate; postfemoral dermal pocket present; enlarged postanals present in males.

Color.—General ground color olive-brown (females) to buffy brown (males); a dorsolateral light line on each side of body, originating at posterior corner of the eye and terminating at base of tail, from one and one-half to one and two half scale rows wide; between these light lines, two series of nine or ten auburn-colored spots, light-bordered posteriorly, the two series separated medially by a faint light line about two scale rows wide; sides of body usually with obscure narrow dark bars, their inner ends coincident in position with the corresponding bars on the back; males with a more or less evident brown band on each side of body below dorsolateral light lines; a dark spot in axilla (coincident with blue borders of lateral abdominal marks in males), extending over shoulder a short distance in front of arm, interrupted by a white band passing dorsally from arm; this dark spot variable in size and intensity of color, usually less distinct and smaller in females; limbs with narrow light and broad dark bars, usually more distinct on shank and posterior surface of lower foreleg, occasionally quite indistinct; posterior surface of thigh with two irregular dark lines separated from each other by a broader white line; tail with a series of narrow chevron-shaped bars. Males with lateral abdominal marks pink in color, with dark blue borders quite broad anteriorly and posteriorly; gular region faintly mottled in males.

Strecker and Johnson (1935, pp. 20–21) describe a specimen from life as follows: "A male specimen collected July 5 had the lateral stripes of a rich buffy yellow, this being margined below by deep maroon. The light stripe from shoulder and femoral region was bright yellow and the margin of the shoulder stripe was black, this line connecting with the ellipsis on the belly. The ear was margined with orange. The ellipsis was rose pink outlined by a double stripe of blue and black. The back was very light brown while the tail above had a distinctly buffy tinge. The top of the head was a rich coppery brown and the sides of the head were striped with buff and pinkish brown."

Variation.—The variation in head scutellation of 24 specimens has been recorded. Frontoparietals one to three (1, five; 2, thirty-eight; 3, three). Frontal touches interparietal in three specimens; frontoparietals separated medially by an azygous scale in three, in contact medially in 16; anterior section of frontal divided in all

specimens; supraoculars four to six (4, three; 5, seventeen; 6, four); an azygous scale (or two) always separating prefrontals medially; subnasal absent on one side in two specimens, on both sides in one; first canthal touching lorilabials on one side in two specimens, on both sides in two; preocular entire on one side in three, on both sides in one; postrostrals two to five (2, five; 3, one; 4, twenty-one; 5, one); loreals one to three (1, sixteen; 2, twenty-one; 3, eighteen).

Dorsal scales 58 to 69, average 64.1 (44 specimens: 58, one; 59, three; 60, two; 61, two; 62, four; 63, two; 64, eight; 65, twelve; 67, five; 68, four; 69, one).

Habits and habitat.—*S. v. marmoratus* is typically found in semi-arid regions, where it frequents the limbs of mesquite and other scrubby trees. Strecker (1922) remarks that he has found specimens on limestone bluffs, and that it occurs also on *Opuntia*. They are usually shy and wary creatures, difficult to collect.

Strecker and Johnson (1935) give interesting notes on the habits, habitat, and eggs of this subspecies.

Locality records.—TEXAS: BANDERA CO.: (Strecker, 1915); Medina (USNM 2916). BEXAR CO.: Helotes (ANSP 8528–33, 12553–7; KU 11005–8; EHT 5); Leon Springs (CAS 31130–2, 31138, 31147); 14 mi. from San Antonio, toward Leon Springs (Strecker, 1922); San Antonio (MCZ 19997; CM 8294–5; AMNH 9417, 37386–9; UMMZ 71142; USNM 16020); Somerset (KU 15355; USNM 71739; CM 8470–1). CAMERON CO.: Loma Alta (FMNH 6813–8); 4 mi. E of Rio Hondo (UMMZ 74744 [3]); Brownsville (MCZ 13831, 13905–12). DALLAS CO.: Dallas (ANSP 13239–40). DUVALL CO.: San Diego (USNM 15654–5); 20 mi. W of San Diego (EHT 3). EL PASO CO.: El Paso (KU 15572). FRIO CO.: Near Dilley (KU 12468, 15192–8); 11 mi. W of Dilley (MCZ 33550); near Pearsall (EHT 225–6). GUADELUPE CO.: (UMMZ 66735). HIDALGO CO.: Mercedes (CM 389–90). JIM WELLS CO.: 36 mi. N of Falfurrias (EHT 4); 11 mi. N of Falfurrias (EHT 3). LA SALLE CO.: 15 mi. N of Encinal (KU 15204–6). LIVE OAK CO.: (USNM 42301–2, 58458); near George West (EHT 1); Oakville (Strecker, 1915). MEDINA CO.: Near Hondo (Strecker and Johnson, 1935). NUECES CO.: Robstown (CM 556); Nueces Bay (USNM 68136); near Corpus Christi (Cope, 1888). SAN PATRICIO CO.: 3 mi. NW of Mathis (MVZ 12702). STARR CO.: Redmond's Ranch (Bellville) (USNM 4116); near Rio Grande City (EHT 4787–95, 4905–12; KU 12467, 15199–203, 15354). WILLACY CO.: Raymondville (UMMZ 53983 [3],

54112). WILSON CO.: Cibolo River Bottoms (Strecker and Johnson, 1935).

COAHUILA: (Boulenger, 1897). NUEVO LEÓN: China (Stejneger, 1891); Monterrey (ANSP 1); San Diego (Stejneger, 1891); Huasteca Canyon, 11 mi. W of Monterrey (EHT 7767); 31 mi. S of Sabinas Hidalgo (EHT 7946). TAMAULIPAS: 4 mi. W of Victoria (EHT 7763); Matamoros (USNM 2886); Charco Escondido (Cope, 1900); Hidalgo (USNM 47371, 46753); Baghdad (USNM 47380); Soto La Marina (USNM 47483); between Monterrey and Ciudad Victoria (EHT 7768); Marmolejo (UMMZ 69236 [12]); Tamaulipeca (UMMZ 69237 [2]); Jaumave Valley (USNM 46730, 46733–4).

Sceloporus variabilis smithi Hartweg and Oliver.

Sceloporus variabilis(?) Cope, Proc. Amer. Phil. Soc., **11**, p. 161, 1869; Sumichrast, Bull. Soc. Zool. France, **5**, p. 163, 1880; idem, Naturaleza, **5**, p. 280, 1881; Cope, Proc. Amer. Phil. Soc., **22**, p. 397, 1885 (part); Boulenger, Cat. Liz. Brit. Mus., **2**, pp. 236–237, 1885 (part); (?)Cope, Bull. U. S. Nat. Mus., **32**, p. 36, 1887 (part); Günther, Biol. Cent.-Amer., Rept. Batr., p. 75, 1890 (part); Boulenger, Proc. Zool. Soc. Lond., **1897**, pp. 516–518, 1897 (part).

Sceloporus variabilis smithi Hartweg and Oliver, Occ. Papers Mus. Zool. Univ. Mich., **356**, pp. 1–5, 1937; Smith, Occ. Papers Mus. Zool. Mich., **358**, pp. 10–11, 1937.

Type locality.—Quiengola Mountain, six kilometers northwest of city of Tehuantepec, Oaxaca. Type UMMZ 81777, collected by Norman Hartweg and James Oliver.

Distribution.—Southern Oaxaca (fig. 45).

History.—This subspecies of *variabilis* apparently received first mention in the literature in 1880, when Sumichrast observed that specimens from the Pacific side of the Isthmus were more vividly colored than others. Günther (1890) later observed the same thing in specimens from the mountains of Huamelula: "The dorsal bands are bright yellow in life, and sharply defined." Several specimens in the National Museum from "Tehuantepec," collected by Sumichrast, were probably referred to by Cope (1869, 1885, 1887).

Diagnosis.—A *Sceloporus* of moderate size (maximum snout-vent measurement 71 mm.); scales from occiput to base of tail 58 to 69, average 63; ventral scales 71 to 92, average 79; scales around body 71 to 91, average 78; scutellation otherwise as in *v. variabilis*. Dorsal ground color chocolate to dark brown; a very broad dorsolateral light line on each side, originating at posterior margin of orbit, terminating on tail; sides of belly pink, blue-bordered, in males; belly usually similarly colored, but less distinct, in females.

Description of type.—Head scales rugose; a single parietal on each side; interparietal subtriangular, rounded, about four times as large as either parietal; frontoparietals in contact medially, divided into two on each side; posterior section of frontal entire, anterior section longitudinally divided; supraoculars five-five, second broadly in contact with frontal; an incomplete row of small scales separating supraoculars from median head scales; one complete and another incomplete row of small scales separating supraoculars from superciliaries; seven superciliaries, six visible from above; prefrontals separated medially by an azygous scale; frontonasals greatly reduced in size, the median separated from the lateral scales; internasals irregular; nasal elongate, pierced by nostril in extreme posterior border; three postrostrals; subnasal small; first and second canthals subequal in size; first canthal separated from lorilabials; loreals irregular, three-four; preocular divided, upper section strongly keeled; subocular elongate, strongly keeled; postoculars two-three, keeled; lorilabials weakly keeled, in a single row; four supralabials and four infralabials to a point below middle of eye.

Mental pentagonal, with a labial border about three-fourths that of rostral; four postmentals on each side, the anterior scale in either row contacting its fellow medially; anterior scale of outer row of labiomentals wedged between posterior part of first infralabial and first postmental; posterior gular scales with an apical notch; some scales in gular fold region with two apical notches; median and posterior gular scales somewhat smaller than others; scales immediately below ear opening very small.

Auricular lobules four on each side, acuminate, smooth, irregular, much larger than preceding scales, the longest extending about two-thirds the distance across ear; temporal scales mucronate, keeled, subequal in size to largest scales between ear and nuchal pocket; a fold from middle of lateral nuchal pocket to lower edge of ear, surmounted by acuminate, very strongly keeled, enlarged scales; scales above arm and between arm and lateral nuchal pocket granular.

Dorsal scales mucronate, weakly denticulate, very strongly keeled, 62 from occiput to base of tail; 14 rows of dorsals at nape, 14 at middle of body, 11 at rump; lateral scales about one-fourth size of dorsals, subequal in size to, or somewhat smaller than, ventrals, arranged in oblique rows; 76 scales around middle of body; ventrals smooth, notched, arranged in strongly divergent rows; 75 scales from fold region of neck to anus; scales on chest somewhat larger than those on belly; preanals smaller than preceding scales.

Scales on dorsal surface of foreleg mucronate, keeled, subequal in size, somewhat smaller than dorsal scales of back; scales on ventral surface of lower foreleg about one-half size of dorsal scales of same member; anteroventral scales of lower foreleg smooth, weakly denticulate, scales on posteroventral surface keeled, mucronate; scales on ventral surface of upper foreleg very small, gradually increasing in size distally; lamellar formula for fingers 8–12–18–17–11 (8–12–16–17–10).

Scales on dorsal surface of hind leg mucronate, keeled, those on thigh subequal to those on back, dorsals on shank somewhat larger; scales on anterior and ventral surface of thigh smooth, notched, becoming smaller toward series of femoral pores; scales on posterior surface of thigh very small, becoming somewhat larger near series of femoral pores; femoral pores 12–13; scales on posterior surface of shank mucronate, smooth, much smaller than dorsals of same member; scales on ventral surface of shank smooth, weakly notched, slightly smaller than dorsals of same member; lamellar formula for toes 9–11–18–22–16 (7–11–18–22–16).

Scales on dorsal surface of tail strongly mucronate, strongly keeled, somewhat larger than dorsals of back; subcaudals strongly denticulate, smooth except at extreme tip of tail; postanals enlarged; a postfemoral dermal pocket.

Color.—"Head brown above, lighter than body; body blackish-brown dorsally, bordered on each side by a brilliant white stripe which covers in its widest part two complete rows of scales and one-half of the adjoining dorsal and ventral rows; this stripe reaches from posterior border of eye to base of tail; laterally, below stripe, body somewhat darker than dorsally; another light stripe extends from labial region below eye across median two auricular lobules; a short, bluish-white bar above insertion of upper foreleg; a black vertical bar in front of foreleg; forelegs and hind legs bluish, more or less distinctly banded with black on their upper surfaces; body ventrally a dirty light blue on chin, neck and chest; this color continues posteriorly as a thin line across the ventrals, separating abdominal patches; abdominal patches pinkish, washed with faint pale blue, bordered with deep dark blue; under surfaces of hind legs black in femoral pore region; under surface of tail light blue with a gray tinge." (Hartweg and Oliver, field notes, 1936.)

Variation.—The scutellation of the head in 57 specimens varies as follows: parietals one or two, usually one; frontoparietals one to three on each side (1, seven; 2, ninety-three; 3, six); frontoparie-

tals separated medially by an azygous scale in two specimens, in contact in the others; anterior section of frontal longitudinally divided in all; posterior section of frontal divided into two or three scales in 19 specimens; supraoculars four to six (4, two; 5, one hundred; 6, ten); some of supraoculars contact median head scales in eleven specimens (the row of scales separating supraoculars from median head scales complete in the others); prefrontals contact medially in four; frontal contacts median frontonasal in one; azygous scale separates prefrontals medially in 107 specimens; nasal in contact with rostral on both sides in one, on one side in two; median frontonasal usually separated from lateral scales; subnasal absent in two; first canthal touches lorilabials in three; preocular divided in all; loreals two to four, usually three; subocular separated from supralabials by two complete rows of lorilabials on one side in three, on both sides in four.

Hartweg and Oliver (1937) have presented the following data on variation based on counts of 71 specimens.

	Whole range	Range of median 90 per cent	Range of median 75 per cent	Range of median 50 per cent	Average
Scales around body	71–91	73–85(84)	74–83(82)	74–80	78
Ventrals	71–92	72–87(84)	74–83	75–81	79
Dorsals	58–69	59–68	60–66	60–64	63
Lamellae fourth toe	20–24	21–24	21–24	22–24	22
Femoral pores	11–15	12–14	12–14	12–13	13

Females have a coloration similar to that of the males, but less distinct. They are remarkable in having ventral markings like the males, though much less well defined. The sides of the belly are gray-blue, exhibiting but a slight pinkish suffusion. The sides of the neck and head in the temporal and labial regions are reddish to pink in adult females. The ventral surfaces of the thighs are dirty white.

Relationships.—Sceloporus v. smithi seems to be most closely related to *v. variabilis*. There is no tendency whatsoever toward *v. olloporus*. A single specimen from Tapanatepec, Oaxaca, tends strongly toward *v. variabilis*, having a dorsal scale count of 55. The dorsal coloration, however, is identical with that of *v. smithi*. Specimens of *v. variabilis* from Tonalá, Chiapas, have the coloration typical of their subspecies, but the average dorsal scale count of this series is 59.3 (average for typical *v. variabilis*, 54.5). Specimens of *v. variabilis* from El Hule, Oaxaca, tend somewhat toward *v. smithi* in coloration.

Habits and habitat.—Hartweg and Oliver (1937) write: "The specimens collected by ourselves were all found in Quiengola Mountain, a very rugged, rocky mountain about 2,000 feet high (estimate). Most specimens were seen and procured when we were either ascending or descending the exceedingly steep, rough trail on the mountain side. They were indeed striking creatures to behold, clinging to the sides of jagged rocks, their brilliant wide yellowish-white dorsolateral stripes causing them to be startlingly conspicuous. None were ever found on the plains; the absence of rocky habitats rather than the lack of elevation is probably the reason for this."

Specimens I collected at Totolapan, Oaxaca, were found in the thatched roof of an underground storage bin. They were immediately observed to differ widely in coloration from *v. variabilis*. The coloration of these in life was bright chocolate.

Locality records.—OAXACA: Quiengola Mountain, 6 km. N of Tehuantepec (UMMZ 81777–81810; AMNH 19365–7); San Pedro Mt., 17 km. W of Tehuantepec (UMMZ 81811–3); Mixtequillo Mt. (UMMZ 81814–5); near Mixtequillo (AMNH 18044–5, 19362–4, CAS 73418–20); Chacalapa (AMNH 18371–4); Coyul (AMNH 18504); San Geronimo (Ixtepec) (FMNH 1472 [7]); Totolapan (EHT 7875–7); Mts. of Huamelula (Boulenger, 1885); Tehuantepec (USNM 30332–7, 46994; AMNH 58043–50).[1]

Sceloporus variabilis olloporus Smith.

Sceloporus variabilis Bocourt, Miss. Sci. Mex., Zool., **3**, sec. 1, pp. 200–202, 1874 (part); Müller, Verh. Naturf. Ges. Basel, **6**, pp. 573, 633, 1878; Cope, Proc. Amer. Phil. Soc., **22**, pp. 379, 397, 1885 (part); (?)Boulenger, Cat. Liz. Brit. Mus., **1**, pp. 236–237, 1885 (part); Cope, Bull. U. S. Nat., Mus., **32**, p. 36, 1887 (part); Günther, Biol. Cent.-Amer. Rept. Batr., p. 75, 1890 (part); (?)Boettger, Kat. Rept. Senck. Mus., p. 65, 1893; (?)Boulenger, Proc. Zool. Soc. Lond., **1897**, pp. 516–518, 1897 (part); (?)Werner, Abh. Bayer. Akad. Wiss., Math.-Phys. Kl., **22**, Abt. 2, p. 344, 1903; Schmidt, Field Mus. Nat. Hist., Zool. Ser., **12**, p. 193, 1928; Dunn and Emlen, Proc. Acad. Nat. Sci. Phila., **84**, p. 28, 1932; Burt, Trans. Amer. Micr. Soc., **54**, p. 174, 1935.

Sceloporus variabilis olloporus Smith, Occ. Papers Mus. Zool. Univ. Mich., **358**, pp. 11–13, 1937.

Type locality.—San Juanillo, Costa Rica. Type UMMZ 71207, collected by Austin Smith, Oct. 7, 1931.

Distribution.—South central Guatemala to central Costa Rica, mostly on the Pacific slopes (fig. 45).

[1] The locality given by Boulenger (1885) as San Geronimo, is in Guatemala (fide Boulenger, 1897), not Oaxaca.

Diagnosis.—A moderate-sized *Sceloporus*, maximum snout-vent measurement 70 mm.; head scales rugose; dorsal scales usually 48 to 59, average 52.7; ventral scales 57 to 72, average 65.1; scales around body 53 to 68, average 58.8; femoral pores usually 8 to 11, average 9.8; dorsal scales strongly keeled, strongly mucronate, four to six times as large as lateral scales; latter subequal in size to ventral scales; ventrals smooth, notched apically; frontoparietals usually in contact medially, generally two on each side; anterior section of frontal longitudinally divided, posterior section frequently divided into two or more scales; supraoculars usually five, occasionally broadly in contact with median head scales; prefrontals separated by an azygous scale (very rarely in contact); median frontonasal rarely typical; subnasal present; first canthal very frequently touching lorilabials; preocular usually divided; postrostrals generally four; loreals usually one; postfemoral dermal pocket present. Color as in *v. variabilis*, except dorsolateral light stripes and dorsal spots frequently more distinct.

Variation.—The variation of this form has been discussed in full in the description of the subspecies.

Locality records.—GUATEMALA: La Primavera (MCZ 28180–7); Sacapulas, 4,500 feet (MCZ 28176–9); El Rancho (FMNH 20567, 20569–74); (?)Campur (Boettger, 1893); (?)San Geronimo (Boulenger, 1885); Rio Negro (Bocourt, 1874); (?)Rio Polochic (Bocourt, 1874); Escuintla (Bocourt, 1874).

SALVADOR: La Union (Bocourt, 1874).

HONDURAS: Copán (UMMZ 1); Subirana (MCZ 32279–82, 38853–38900 [96]; FMNH 21779 [17], 21780 [13], 21834–7; UMMZ 77856 [25], 77857 [28], 77858 [25], 77859 [18]); Tegucigalpa (FMNH 3215 [16]); Ventas (FMNH 5216–7); Pespire (FMNH 5218); Siguatepeque (FMNH 5219–25); Mataderos Mts. (FMNH 21868–9; MCZ 38856 [2]); Portillo Grande (MCZ 32269–78, 38855); Santa Barbara (MCZ 28195); Cantarranas (Dunn and Emlen, 1932); Rio Hugito (Dunn and Emlen, 1932).

NICARAGUA: (USNM 7322 [25], 11020 [3], 25251); Granada (USNM 58459–60; FMNH 1949 [21], 1950 [9]; CAS 14091–4); Polvón (USNM 5793 [6]; CAS 54642); Momotomba (FMNH 2059, 1957); Lake Nejapa (FMNH 2450 [7], 2451 [2], 2452 [2]); Corinto (LMK 7324–6); Gulf of Fonseca (CAS 48961–3).

COSTA RICA: Port Culebra (LMK 10114–8); 8 mi. S of Santa Cruz, Guanacaste (UMMZ 71200 [2]); Sierra de San Juan, Guanacaste (UMMZ 71199); Liberia, Guanacaste (UMMZ 71996); San

Juanillo (UMMZ 71207 [2]); Esparta (MCZ 20001–4); Alajuela (MCZ 15387); Ballena, Nicoya Peninsula (USNM 37099, 37100); Circuelas, 900 feet (USNM 37101–2).

THE MERRIAMI GROUP[1]

One species, with its two subspecies, requires consideration as a special group. The species differs from all other species of *Sceloporus*

FIG. 46. Distribution of *Sceloporus maculosus*, □; *S. parvus parvus*, ○; *S. p. scutulatus*, △; *S. merriami merriami*, ▽; and *S. m. annulatus*, ⊖.

in the combination of small dorsal scales and granular lateral scales. Its essential characteristics may be given as follows: small dorsal scales (47 to 70); lateral scales granular; femoral pores numerous, nearly meeting in interfemoral region; preanal scales smooth; enlarged postanals present in males; belly patches present in males;

[1] Specimens examined about 300.

tendency toward loss of subnasal; tendency to have anterior section of frontal divided; rudimentary gular fold present; scales on posterior surface of thigh granular; no postfemoral dermal pocket.

It seemed at first possible to place *merriami* in the *utiformis* group, as there is a resemblance of the two species in the character of the lateral and dorsal scales. I am now of the opinion that *merriami* has no close relationship with *utiformis*, and that the resemblances of the two forms are results of parallel development.

That *merriami* is closely related to the *variabilis* group is shown by almost every character mentioned above. Since *couchii* has the smallest lateral scales of any species in its group, femoral pores the most numerous, belly coloration similar to *merriami*, rudimentary gular fold, and is of approximately equal size, I believe that it is the form most closely related to *merriami*. There is a marked tendency in the *variabilis* group for the anterior section of the frontal to be split longitudinally, as in *m. annulatus* (see fig. 42, for diagrammatic representation of phylogeny).

S. merriami has been separated from the *variabilis* group largely because of the absence of a postfemoral dermal pocket. There are numerous other minor differences between the two groups.

Of the two subspecies, *m. annulatus* appears to be the more primitive, as it retains the typical *variabilis* condition of a split anterior section of the frontal. *S. m. merriami* is exceptional in the character of the frontal (among the *variabilis* derivatives); it also has the unusual character of having the anterior scale of the outer row of labiomental scales wedged between the first postmental and first infralabial. Another minor point, its larger size, compared with *m. annulatus*, suggests a more recent development of *m. merriami*.

KEY TO SUBSPECIES OF THE MERRIAMI GROUP

Anterior section of frontal usually divided; frontoparietals usually divided; outer row of labiomental scales rarely terminating with the first scale wedged between first infralabial and first postmental; head scales rugose; subcaudal surface distinctly banded; gular bars extensive, confluent medially.....*m. annulatus* (p. 289)

Anterior section of frontal rarely divided; frontoparietals rarely divided; outer row of labiomentals terminating with the first scale wedged between first infralabial and first postmental; head scales smooth; subcaudal surface nearly or quite immaculate, not barred; gular bars short, usually separate medially.....*m. merriami* (p. 285)

Sceloporus merriami merriami Stejneger.

Sceloporus couchii Stone, Proc. Acad. Nat. Sci. Phila., **55**, p. 540, 1903—Devil's River, Texas.

Sceloporus merriami Stejneger, Proc. Biol. Soc. Wash., **17**, pp. 17–20, 1904; Bailey, N. Amer. Fauna, **25**, pp. 42–43, 1905; Strecker, Baylor Bull., **18**,

No. 4, p. 21, 1915; Stejneger and Barbour, Check List N. Amer. Amph. Rept., p. 55, 1917; idem, 2nd ed., p. 57, 1923; Wright and Wright, Proc. Biol. Soc. Wash., **40**, pp. 57–63, pls. 1–3, 1927; Stejneger and Barbour, Check List N. Amer. Amph. Rept., 3rd ed., p. 62, 1933; Smith, Trans. Kans. Acad. Sci., **37**, pp. 269–270, 1934; idem, Proc. Biol. Soc. Wash., **47**, p. 130, 1934; Strecker and Johnson, Baylor Bull., **38**, No. 3, p. 20, 1935; Burt, Trans. Kans. Acad. Sci., **38**, pp. 276, 299, 305, 1936; Dunn, Proc. Acad. Nat. Sci. Phila., **88**, pp. 473, 474, 1936; Burt, Papers Mich. Acad. Sci., **22**, pp. 534, 535, 1937.

Sceloporus merriami merriami Smith, Proc. Biol. Soc. Wash., **50**, pp. 83–86, 1937.

Type locality.—East Painted Cave, near mouth of Pecos River, Texas. Type USNM 33039, collected by W. Lloyd, September 2, 1890.

Distribution.—The Rio Grande Valley from southeastern Val Verde County, Texas, to western Brewster County (fig. 46).

Diagnosis.—A small species of the genus *Sceloporus,* maximum snout-vent measurement about 58 mm.; head scales nearly or quite smooth; frontoparietals usually single on each side, very frequently in contact medially; anterior section of frontal rarely divided longitudinally; superciliaries usually five; supraoculars four to six, generally five; usually one row of small scales separating posterior supraoculars from median head scales, frequently another short row intercalated posteriorly; prefrontals often in contact medially; anterior scales of outer row of labiomentals wedged between first postmental and first infralabial; dorsal scales 53 to 70, average 62.8; ventral scales 77 to 90, average 81.9; scales around body 86 to 120, average 100.4; femoral pores 22 to 30, average 25.8; scales between femoral pore series none to three, average 1.7; lamellae on free part of fourth toe 24 to 30, average 26.9; lateral scales on sides of body and scales on posterior surface of thigh granular; no postfemoral dermal pocket; enlarged postanals present. Adult males with dark blue median borders separated on middle of abdomen by a narrow light band; middle of throat with dark blue blotches, into which pass a number of broad diagonal light blue bands; tail not or very indistinctly banded; females frequently with ventral abdominal markings similar to males.

Description.—The complete description of the scutellation of *m. annulatus,* given in the original description of that form, makes it unnecessary to describe *m. merriami* in detail. The scutellation is essentially similar, with the exceptions noted in the diagnosis.

Color.—General dorsal ground color light gray to blue gray; a series of ten to eleven small indistinctly outlined spots on either

side of mid-dorsal line on body, the spots becoming gradually larger posteriorly; numerous scattered pale blue and white flecks on body and tail, fewer on limbs; head pale brown; a pair of small brown spots frequently present at posterior edge of parietal, one to each side; limbs and tail indistinctly banded; toes with rather indistinct bands.

Ventral surfaces of abdomen with deep vinaceous lavender on sides, bordered medially and posteriorly by a broad dark blue band, wider posteriorly near groin; these borders rarely confluent medially; rarely, in large males, these borders continue anteriorly across chest to gular fold region; a black spot on shoulder, occasionally passing ventrally onto chest, there becoming dark blue; frequently scattered dark blue spots on ventral surface of thigh and on chest; ventral surface of tail and, frequently, chest, a narrow median ventral line and ventral surfaces of thighs, pale blue; occasionally ventral surface of tail with faint darker bands; posterior part of gular region with two rather large dark blue spots, frequently preceded by one or two pairs of smaller spots; these spots connected with pale blue bands crossing onto labial region; upper labial region with faint brown bands, the one below middle of eye most distinct.

Females essentially similar to males in dorsal coloration. Ventral surface of abdomen immaculate, save a dark blue elongate spot at extreme posterolateral part (comparable to posterolateral markings on abdomen of males); occasionally the spot as large as in small males, and the median dark blue border present; spots on throat similar to those in males, but less distinct; ventral surfaces otherwise, usually, white or cream.[1]

Variation.—Frontoparietals one to three (134 specimens: 1, one hundred; 2, three; 3, seven); frontoparietals one or two (1, two hundred and twenty-nine; 2, thirty-nine); frontal touches parietal in seven; an azygous scale between frontoparietals in none; frontoparietals contact medially in 55; anterior section of frontal longitudinally divided in one (partially divided in five) (168 specimens); superciliaries three to six (61 specimens: 3, one; 4, five; 5, one hundred and six; 6, eight); supraoculars four to six (4, forty-one; 5, sixty-three; 6, nine); supraoculars never in contact with median head scales; prefrontals in contact in 62, separated by an azygous scale in 74 (136 specimens); nasal contacts rostral on one side in one specimen; subnasal present on both sides in 35, on one side in eight; first canthal

[1] A complete color description from life is given by Wright and Wright, 1927, pp. 59–60.

in contact with lorilabials in all; preocular divided on one side in seven, on both sides in six; two loreals on one side in one, other specimens with one; anterior scale of outer row of labiomentals with the anterior scale wedged between first postmental and first infralabial on one side in three specimens, on both sides in 131; labiomentals terminating behind first postmental on one side in three specimens, on both sides in one.

Dorsal scales 53 to 70, average 62.8 (82 specimens: 53, one; 55, three; 56, five; 58, one; 59, three; 60, seven; 61, seven; 62, eleven; 63, nine; 64, ten; 65, five; 66, five; 67, eight; 68, six; 69, three; 70, one); scales around middle of body 86 to 120, average 100.4 (62 specimens: 86, one; 87, three; 88, two; 90, one; 91, four; 92, two; 93, three; 94, four; 95, one; 96, three; 97, one; 98, one; 99, three; 100, one; 101, two; 102, four; 103, two; 104, one; 105, two; 106, two; 107, five; 108, six; 109, one; 110, one; 112, one; 114, two; 115, one; 118, one; 120, one); ventral scales 77 to 90, average 81.9 (32 specimens: 77, two; 78, two; 79, four; 80, two; 81, six; 82, four; 83, four; 84, two; 85, two; 86, two; 90, two); femoral pores 22 to 30, average 25.8 (92 counts: 22, one; 23, five; 24, thirteen; 25, eighteen; 26, twenty-six; 27, eighteen; 28, nine; 29, one; 30, one); scales between femoral pore series none to three, average 1.7 (none, two; 1, seventeen; 2, twenty-seven; 3, seven); lamellae on free part of fourth toe 24 to 30, average 26.9 (40 counts: 24, one; 25, six; 26, ten; 27, ten; 28, eight; 29, four; 30, one).[1]

Habits and habitat.—Wright and Wright (1927) have notes on the habits of this subspecies, which they found on rocky canyon walls, usually in shade, and apparently not very wary. They record bobbing movements similar to those of *Holbrookia*. The species apparently is oviparous. Specimens with eggs in the body were collected on July 1, 1925 (Wright and Wright).

Locality records.—TEXAS.—BREWSTER CO.: Boquillas (UMMZ 66168, 66170–1, 66173–5; USNM 33034; MCZ 31718–9); Hot Spring (UMMZ 66163, 66176, 69855 [2]; MCZ 31716–7). TERRELL CO.: 15 mi. E of Sanderson (KU 10839). VALVERDE CO.: Devil's River (KU 14949–56; EHT A788–A801); mouth of Devil's River (KU 10840–52); Pecos River (MCZ 33548); Pecos River, 55 mi. N

[1] Part of data taken from Stejneger (1904) and Wright and Wright (1927). I have not used the femoral pore counts of the latter authors, for I am at a loss to account for the remarkably low counts which they obtained (13, one; 15, one; 18, one; 19, two; 20, five; 21, one; 22, four; 23, eight; 24, six; 25, three; 26, one; 27, two). The lower counts may be misprints, or may be taken from specimens of *Uta stansburiana stejnegeri*, which has low femoral pore counts, and which I have found confused with *merriami* in certain collections.

of Comstock (Bailey, 1905); East Painted Cave, near mouth of Pecos River (USNM 33036–40); 5 mi. E of mouth of Pecos River (KU 14957–92); Castle Canyon, W of Devil's River (KU 15165–88); mouth of Pecos River (KU 12683–95; USNM 33035); between Del Rio and Langtry (UMMZ 69854); rocky ravine 4 mi. W of Comstock (Wright and Wright, 1927); Comstock (USNM 33033).

Sceloporus merriami annulatus Smith.

Sceloporus merriami Strecker, Baylor Bull., **38**, No. 3, p. 36, 1935.

Sceloporus merriami annulatus Smith, Proc. Biol. Soc. Wash., **50**, pp. 83–86, 1937.

Type locality.—East slope of Chisos Mountains, Brewster County, Texas. Type EHT A787, collected by E. H. Taylor and Jack Wright, August, 1931.

Distribution.—Southern and central Brewster County, Texas, and adjacent Coahuila (fig. 46).

Diagnosis.—A small species of the genus *Sceloporus*, maximum snout-vent measurement about 51 mm.; head scales slightly rugose; frontoparietals usually divided into two or three scales on each side, rarely separated medially; anterior section of frontal usually longitudinally divided; posterior section of frontal frequently divided into two or three scales; superciliaries usually five, occasionally four or six; enlarged supraoculars rather irregular, four to seven on each side, occasionally one or more divided transversely; usually one row of scales separating posterior supraoculars from median head scales, rarely another short row intercalated posteriorly; prefrontals rarely in contact medially; outer row of labiomentals occasionally terminated anteriorly with the first scale wedged between first postmental and first infralabial; dorsal scales 47 to 62 from occiput to base of tail, average 53.3; scales around body 85 to 101, average 91.7; ventral scales (from a line between shoulders to anus) 78 to 90, average 83.6; femoral pores 19 to 28, average 23.8; lamellae on free part of fourth toe 20 to 27, average 23.5; scales between series of femoral pores one to five, average 2.7; lateral scales on body and scales on posterior surface of thigh granular; no postfemoral dermal pocket. Adult males with the dark blue median borders of lateral abdominal marks confluent, covering middle of abdomen and extending over most of ventral surface of thighs; broad, dark blue convergent bands on throat; blue tail bands confluent on ventral surface of tail, or nearly so, in both males and females.

Variation.—Some additional material has appeared since my description of this form. A series of fifteen *m. annulatus* from

localities near Terlingua, while not showing a tendency toward *m. merriami* in the two "key" characters mentioned above, do appear to be intermediate in dorsal scale count and in having the anterior section of the frontal entire. Seven of this series have the anterior section entire, and another has it partially divided. Every one has a dorsal scale count above the average for the subspecies. The average for this series is 57.1 (minimum 55; maximum 62) (average for subspecies 53.3).

Three specimens from Jaral, Coahuila (FMNH 1544) appear to be *m. annulatus*. They are typical in coloration and dorsal scale count (48, 50, 55). However, the anterior section of the frontal is entire in all; the anterior scale of the outer row of labiomentals is wedged between first postmental and first infralabial in one specimen; and the femoral pores average higher than usual (24–?, 26–26, 27–28).

Locality records.—TEXAS.—BREWSTER CO.: Glenn Spring (UMMZ 66177–9, 66180 [2], 66181 [2], 66182, 66183 [3], 66184 [2], 66185 [2], 66186 [2], 66187 [2], 66188 [2], 66189 [4], 66190 [7], 66191, 72077; KU 15068; MCZ 31770–3; CM 5007–9); 2 mi. N of Glenn Spring (UMMZ 66192 [2], 66193 [2], 66194); Glenn Draw (UMMZ 66208 [2], 66209 [2], 66215–7, 66219–24, 66227, 66234–5; MCZ 28085–6); Juniper Canyon (UMMZ 66195–66200, 66201 [2], 66202 [2], 66203, 66204 [2], 66205 [2], 66206 [2], 66228–30; MCZ 28087); Boot Spring Basin (UMMZ 66207); N side of Emory Peak (UMMZ 69857); E slope of Chisos Mts. (EHT A787; KU 15058–61, 15063, 15066–7); Terlingua (KU 15069); 10 mi. E of Terlingua (KU 15162–4); 14 mi. N of Terlingua (KU 15988–98); Chilicotal Mts. (UMMZ 66210–4, 66225–6, 66231–3, 69856 [6]; MCZ 31720–2); Study Butte (Strecker, 1935); State Park 33 (FMNH 23753, 23797–8).

COAHUILA: Jaral (FMNH 1544[3]).

THE MACULOSUS GROUP[1]

The species *maculosus* appears to be equivalent to the other groups recognized. It is most closely related to the *variabilis* group, but differs from that group in a number of important characters. The important characteristics of *maculosus* are: postfemoral dermal pocket present; no postrostrals; poorly developed postanals in males; lateral scales not abruptly differentiated from dorsal scales, in oblique rows; frontal with a single, transverse division; frontonasals three, typical; subnasal shoved back of nasal; lorilabial scales reduced;

[1] Eight specimens examined.

femoral pores numerous, the two series separated medially by one or two scales; preanals smooth in both sexes; dorsal scales moderate in size (47 to 53 occiput to base of tail); and small size (maximum snout-vent measurement 50 mm.).

The species of the *variabilis* group most closely related to *maculosus* seems to be *parvus*. The belly coloration of males of *maculosus* is not greatly different from that of *parvus* (see fig. 42 for diagrammatic representation of phylogeny).

Sceloporus maculosus Smith.

Sceloporus maculosus Smith, Trans. Kans. Acad. Sci., **37**, pp. 267–269, pl. 8, figs. 2, 4, pls. 10, 11, 1934.

Type locality.—Fourteen miles northeast of Pedriceña, Durango, Mexico. Type EHT 7648, collected by E. H. Taylor and H. M. Smith.

Distribution.—Known only from east-central Durango (fig. 46).

Diagnosis.—A small *Sceloporus*, maximum snout-vent measurement 50 mm.; head shields smooth; frontal transversely divided; no postrostrals; dorsals 47 to 53 from occiput to base of tail; lateral scales larger than ventrals, smaller than dorsals, not abruptly differentiated from dorsals, in oblique rows; femoral pores 18 to 23 on each side, the series separated medially by one or two scales; males without or with but poorly differentiated postanals; postfemoral dermal pocket present.

Description of type.—Dorsal head scales smooth, some pitted; interparietal large, more or less rounded, about three times the size of the two parietals on either side; frontoparietals single on each side, rectangular; frontal transversely divided, the posterior section in contact with interparietal; enlarged supraoculars four on each side, the anterior preceded by three small scales; one row of small scales between supraoculars and median head scales; one complete and another incomplete row of small scales between supraoculars and superciliaries; superciliaries six, five visible from above; prefrontals in contact medially; frontonasals three, typical; two pairs of large internasals, the anterior pair in contact with rostral; a small, triangular piece split from the anterior median part of nasal; nasal partially divided, the suture extending directly forward from naris; nasal in contact with lateral edges of rostral; no postrostrals; subnasal small, pushed back of nasal; two canthals, the first in contact with lorilabial scales; one loreal; preocular divided; two postoculars; one complete and another incomplete row of lorilabials; four supralabials and five infralabials to a point below middle of eye.

Mental pentagonal, with a labial border about one-half that of rostral; outer row of labiomentals separated from mental by complete contact of first postmental and first infralabial; two pairs of large postmentals, the scales of the anterior pair in contact medially; gular scales smooth, notched; scales in gular fold region distinctly smaller than preceding scales.

Four smooth, pointed auricular lobules, the longest extending across ear opening, all larger than preceding scales; temporal scales

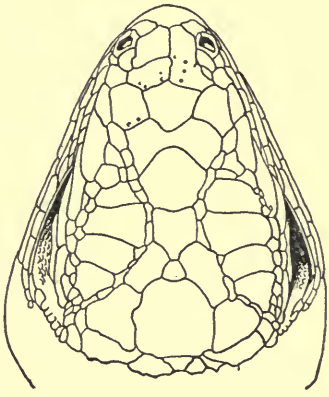

Fig. 47. Head scales of *Sceloporus maculosus*.

very weakly keeled, rounded, smaller than scales between ear and nuchal pocket; a weak fold extending obliquely upward and posteriorly from upper edge of lateral nuchal fold to an indefinite point above arm insertion; scales below this fold granular, much smaller than those above or in front of the fold.

Dorsal body scales keeled, rather strongly mucronate, not denticulate, in parallel rows converging posteriorly; lateral scales similar to dorsals, about two-thirds size of the latter, in oblique rows; ventral abdominal scales smooth, apparently rounded, about one-third size of dorsal scales; scales on chest somewhat larger than ventral abdominals; preanal scales smooth, slightly larger than ventral abdominals.

Dorsal scales of foreleg keeled, mucronate, those on upper foreleg somewhat larger than those on lower foreleg and about two-thirds size of dorsals on body; ventral scales of lower foreleg about three-fourths size of dorsal scales of same member, pointed, smooth except near hand and near posterior surface of limb; median ventral scales of upper foreleg very small, increasing in size toward anterior and posterior surfaces; lamellar formula for fingers 8–13–16–15–12 (8–13–16–15–13).

Dorsal scales of hind leg keeled, mucronate, those on shank considerably larger than dorsals on thigh and nearly as large as dorsals on body; scales on anterior and ventral surfaces of thigh smooth, becoming smaller toward femoral pore series; latter long, closely approximated medially, separated from each other by one or two scales smaller than preanal scales; scales on posterior surface of thigh granular; ventral scales on shank smooth, pointed, about two-thirds size of dorsals of same member; lamellar formula for toes 9–12–18–20–15 (8–11–17–19–14).

Dorsal caudal scales keeled, rather strongly mucronate, about one and one-half times as large as dorsal body scales; basal subcaudals smooth, pointed; postanals not distinctly enlarged; postfemoral dermal pocket present.

Color.—Above, light blue; about nine or ten indistinct transverse blackish bands across back, dividing into more numerous bands on sides, excluding much of the lighter color; a few whitish spots scattered over limbs, sides, and back; a broad blue patch on either side of belly, extending from axilla to groin and each bordered medially by a darker blue band, almost in contact on the median line; anterior ventral surfaces of thighs coarsely reticulated with very dark blue; posterior ventral surfaces of thighs and preanal region whitish; otherwise, ventral surfaces of limbs and of tail light blue; a few black streaks on breast extending from in front of insertion of foreleg; posterior part of gular region whitish, with blackish encroaching from the sides along the fold; anterior part of gular region light blue, with diagonal bands of whitish passing from lower labial region posteriorly toward the median line; three black bands on anterior aspect of upper foreleg; a rounded white spot on sides of neck immediately in front of insertion of the foreleg, bounded above and on each side by black, which extends dorsally to the dorsolateral region.

In some males the dorsal bands are rather indistinct; one specimen is as inconspicuously colored as the females; in the three other males the scattered whitish spots are prominent. In none are the dark blue bands on either side of the belly so closely approximated as in the type, but in no case are they more than two or three scale rows apart at the closest approximation.

The females are almost uniform bluish or brownish above, with very faint indications of the dorsal bands; the ventral surfaces are whitish or slightly tinged with bluish; the anterior part of the gular region is marked as in the males, but less prominently.

Variation.—In seven specimens the variation in cephalic scutellation is as follows: parietals one on one side in one specimen, two in others; frontoparietals two on one side in one; frontal touches interparietal in four, separated by an azygous scale in two, by contact of frontoparietals in one; supraoculars four to six (4, eight; 5, five; 6, one); two or more supraoculars in contact with median head scales in four; prefrontals in contact in six, separated by an azygous scale in one; two pairs of internasals in all; preoculars divided in five, entire in one; one row of lorilabials below subocular in one on one side, on both sides in five; lorilabials incomplete below subocular (latter in contact with a supralabial) on one side in one, on both sides in one.

The basal subcaudals in females are keeled; the postanals are not distinct in any of the males. The tail of this species is apparently very brittle; only one female possesses a complete tail; the remainder of the specimens have broken or regenerated tails.

Habits and habitat.—The eight specimens collected were found running about on rocks in low, almost barren hills, in a semiarid region. They were extremely wary, but could occasionally be caught alive from under rocks where they would seek shelter upon approach. Their bluish, more or less speckled coloration blends well with the color of the rocks among which they live.

Locality records.—DURANGO: 14 mi. NE of Pedriceña (EHT 7644–8); 6 mi. NE of Pedriceña (EHT 7642–3).

THE CHRYSOSTICTUS GROUP[1]

Another single species, *Sceloporus chrysostictus* Cope, forms a separate section of the genus. This species differs from members of the *variabilis* group in its imbricating scales on the posterior surface of the thigh and in the absence of a postfemoral dermal pocket. It differs from the *siniferus* group by the absence of keeled preanal scales in females, by the presence of four postrostrals, and by the peculiar position of the lateral nuchal pocket, the upper edge of which is in contact with the dorsal scales. Other important characters are: males without distinctive ventral coloration; small size (60 mm. snout to vent, maximum measurement); ventral scales notched; postanals distinctly enlarged in males; dorsal scales moderate in size (42 to 57, occiput to base of tail); and anterior section of frontal longitudinally divided.

[1] Approximately 199 specimens examined.

S. chrysostictus appears to have been differentiated from the stem of the *siniferus* group. It is certainly more primitive than species of that group, as it lacks the specialized keeled preanal scales in females and has the primitive four postrostrals (see fig. 48 for diagrammatic representation of phylogeny).

It is noteworthy that three species (*cozumelae, teapensis,* and *chrysostictus*) of two groups (*variabilis* and *chrysostictus*) occupying a compact area (Yucatan Peninsula and adjacent territory) lack or tend to lose the subnasal. *S. cozumelae* and *chrysostictus* are admittedly closely related, as indicated in habits, habitat, habitus, and coloration, as well as in certain features of the scutellation; *teapensis,* however, is also very closely related to *cozumelae,* but has the distinctive belly pattern of the males of most species of the *variabilis* group.

Sceloporus chrysostictus Cope.

Sceloporus chrysostictus[1] Cope, Proc. Acad. Nat. Sci. Phila., **1866**, p. 125, 1867; Bocourt, Miss. Sci. Mex. Zool., **3**, sec. 1, p. 202, 1874; Cope, Proc. Amer. Phil. Soc., **22**, pp. 394, 396, 1885; Boulenger, Cat. Liz. Brit. Mus., **2**, pp. 218, 235–236, 1885; Cope, Bull. U. S. Nat. Mus., **32**, p. 35, 1887; Günther, Biol. Cent.-Amer., Rept. Batr., p. 70, 1890; Boulenger, Proc. Zool. Soc., Lond., **1897**, pp. 477, 513, 1897; Cope, Ann. Rept. U. S. Nat. Mus., **1898**, pp. 335, 397–398, 1900; Barbour and Cole, Bull. Mus. Comp. Zool., **50**, No. 5, p. 150, 1906; Shattuck, Carnegie Inst. Wash. Publ., **431**, p. 575, 1933; Stuart, Misc. Publ. Mus. Zool. Univ. Mich., **20**, pp. 8, 21, 23, 26, 31, 33, 45, 1935; Gaige, Carnegie Inst. Wash. Publ., **457**, p. 296, 1936; Smith, Proc. Biol. Soc. Wash., **49**, pp. 89, 91, 1936.

Sceloporus variabilis Barbour and Cole, Bull. Mus. Comp. Zool., **50**, No. 5, p. 150, 1906 (part).

Type locality.—Yucatan. Cotypes USNM 24865–6.

Distribution.—Yucatan, Campeche, Quintana Roo, Petén, and British Honduras (fig. 56).

Diagnosis.—A *Sceloporus* of small size, maximum snout-vent measurement about 60 mm.; head scales rugose; dorsal scales from occiput to base of tail 42 to 57; lateral scales two-thirds or three-fifths size of dorsal scales, in oblique rows; ventral scales smooth, subequal in size to lateral scales; preanal scales not keeled in females; femoral pores 12 to 17 on each side; smallest median scales on posterior surface of thigh three-fourths size of preanal scales; lateral nuchal pouch situated very high on neck, its upper edge in contact

[1] *Sceloporus chrysostictus* Dugès, Naturaleza, (2), **2**, p. 479, 1896, recorded from Huaxteca Potosina (Guanajuato) is undoubtedly based on material of another species, whose identity has not been determined, but which may be *parvus parvus.*

with enlarged dorsal scales; enlarged postanals present in males; two canthals regularly present; four postrostrals; subnasal rarely present; no postfemoral dermal pocket; males uniform white below.

Description.—Head scales rugose, keeled or striated; interparietal large, subtriangular, about four and one-half to six times the size of either parietal; parietals usually single, occasionally a small posterior section split off, more or less wedge-shaped; usually two frontoparietals on each side, occasionally one or three, very rarely separated medially; anterior section of frontal normally longitudinally divided; posterior section usually entire; usually five supraoculars on each side, occasionally four or six; a row of small scales between supraoculars and median head scales, occasionally incomplete; one or two incomplete rows of small scales between supraoculars and superciliaries; six superciliaries usually visible from above; prefrontals always separated medially by an azygous scale; median frontonasal variable, occasionally normal in position and size, frequently broken into small scales or reduced in size and separated from lateral frontonasals by a scale on each side; two pairs of internasals usually present, the posterior pair wedged far between the scales of the anterior pair; two large postinternasals usually present, frequently separating median frontonasal from lateral frontonasal; nasal never in contact with rostral; subnasal very rarely present; two canthals, the first placed below the nasal, subequal in size to second canthal; loreal irregular, entire or divided into two to four small scales; preocular rarely entire; one row of lorilabials, the scales weakly keeled; occasionally a few small scales added to the lorilabial series; three and one-half to four supralabials to a point below middle of eye, the scales imbricating anteriorly; four infralabials to a point below middle of eye, the scales imbricating posteriorly.

Mental pentagonal, with a labial border about two-thirds that of rostral; four to six postmentals behind mental, the first scales in contact medially, the posterior scales separated medially by two to four scales; outer row of labiomentals terminating between posterior part of first postmental and first infralabial; median and posterior gular scales with one or two weak apical notches; median gular scales somewhat smaller than lateral gular scales.

Auricular lobules very small, two or three in number, not or very slightly larger than preceding scales; temporal scales weakly keeled, not mucronate, somewhat larger than scales between ear and lateral nuchal pocket; a weak fold from lower edge of nuchal pocket to lower edge of ear; scales between nuchal pocket and arm about

two-thirds size of temporal scales; nuchal pocket situated very high on neck, in contact with lateral scales of the dorsal rows.

Dorsal scales moderately keeled, pointed or weakly mucronate, 42 to 57 to base of tail (average 48.4); ventral scales 46 to 56 (average 50.8); scales around middle of body 38 to 50 (average 43.2); dorsal scales to head length 9.5 to 12.4; dorsal scales in very irregular, converging rows; about nine rows at rump, about twelve at nape between nuchal pockets; lateral scales three-fifths to two-thirds size of dorsal scales, weakly keeled, weakly or not mucronate, in oblique rows; ventral scales with one or two apical notches, smooth; median abdominal scales somewhat smaller than other abdominal scales; preanal scales slightly smaller than preceding abdominal scales.

Dorsal scales of foreleg weakly keeled, mucronate, those on lower foreleg subequal in size to dorsal scales on body, somewhat larger than dorsals on upper foreleg; ventral scales of lower foreleg somewhat smaller than dorsal scales of same member, very weakly keeled, pointed, weakly denticulate; scales on anterior surface of lower foreleg smooth; ventral scales of upper foreleg very weakly keeled or smooth, pointed, about one-third size of ventral scales of lower foreleg; lamellar formula for fingers 7–12–17–18–10 (8–12–17–19–10).

Dorsal scales of hind leg rather strongly keeled, mucronate, those on thigh subequal in size to dorsal scales on back, those on shank much larger than dorsal scales on back; ventral scales on thigh decreasing in size toward femoral pore series; scales on posterior surface of thigh about three-fourths size of preanal scales; scales on ventral and concealed surfaces of shank smooth, about one-half size of dorsal scales of same member; scales on anterior surface of shank keeled; lamellar formula for toes 8–?–18–25–14 (8–12–17–?–14).

Dorsal caudal scales keeled, strongly mucronate, two or two and one-half times as large as dorsal scales on body; subcaudals smooth on basal third of tail; subcaudals immediately behind anus keeled in females, followed by smooth subcaudals for a short distance and these then replaced, as in the males, by keeled scales; enlarged postanals present in males, normal in size and shape; no postfemoral dermal pocket.

Color.—General dorsal ground color gray-brown in males; a series of nine or ten indistinct bay or chestnut spots on each side of the back, the spots not confluent medially; a dorsolateral light stripe on each side, about two scale rows wide, originating above the ear or at the posterior corner of the eye and terminating on the base of the tail; portion of this stripe between ear and eye sometimes very

indistinct and diffused; below light stripes, on each side, a dark brown band originating at posterior corner of eye and terminating at base of tail; anterior portion of lateral dark band occasionally indistinct; a large, indefinitely outlined black spot extending from arm to dorsolateral light line, and anteriorly to lateral nuchal pocket; tail cinnamon brown, with more or less chevron-shaped, irregular, chestnut brown bands; head cinnamon brown; hind limbs Prout's brown, with chestnut brown bands; fore limbs similar, lighter; ventral surfaces uniform white; lower labial region stippled with black or dark brown; posterior surfaces of thigh with a broad, broken, white band, bordered below with an indistinct dark band.

In adult females the dorsolateral light lines are obsolete or absent; the dorsal dark markings are more distinct than in males; the general ground color is lighter.

In very young specimens the back is nearly uniform light brown, with the spots faintly evident, and the sides are darker. The dorsolateral light line is not strongly evident. In half-grown specimens the sides are barred. In certain adult females, also, the sides are faintly barred.

Variation.—The variation in scutellation of the head has been recorded from 55 specimens. In seven the parietals are divided into two scales on both sides; in 40 they are entire. The frontal touches the interparietal in one; in 53 the frontoparietals are in contact (entire frontal region irregular in one); the posterior section of the frontal is divided transversely in four, and longitudinally divided in one; the anterior section of the frontal is entire in one, longitudinally divided in 53. Supraoculars vary between three and seven (3, one; 4, eight; 5, eighty-one; 6, nineteen; 7, one). In 22 specimens, one or more of the supraoculars are in contact with the median head scales; of these, usually one on each side is involved; in two specimens three on one side and four on the other were in contact with the median head scales. An azygous scale separates the prefrontals in all specimens. The frontonasals are normal (i.e., three, the median in contact with both laterals) in ten specimens, the median separated from one or both lateral frontonasals in 31, and irregularly divided in 14. Subnasal present on both sides in three specimens (120 examined), absent in the remainder. Canthals two on each side in all specimens. Preocular entire on one side in three specimens, divided in the remainder (partly in one). Loreals vary between one and four on each side (1, forty; 2, fifty-five; 3, ten; 4, three.

Femoral pores, in 47 specimens (one side of three), vary between 12 and 17 on each side (12, five; 13, thirteen; 14, twenty-five; 15, twenty-one; 16, nineteen; 17, eight).

Habits and habitat.—At Progreso, Yucatan, I have observed this lizard in great numbers in sparsely overgrown areas within one mile of the shore. Stuart (1935, p. 45) reports that "this species, one of the more common lizards of the region, was found only on the savanna on the small islands of this bush, along the edges of the larger patches of bush, and in the several areas of *acahual* (bush areas of secondary growth). These habitats, while offering protection in the form of larger vegetation, do not approach the forest in character. In studying Santa Cruz Monte I found the lizard along the bush edge, but in the deep forest it was absent. In the center of this forested area there occurred several acres of open scrub growth (possibly resulting from a very rocky condition), and here it was not uncommon.

"What appeared to be newly hatched young were found May 20, on the day following the first heavy rain of the year."

The smallest specimen examined (snout-vent measurement 23 mm.) was collected May 29, 1935, near Vigia, Asunción Bay, Yucatan. Gaige (1936, p. 296) mentions a specimen measuring 23 mm. snout to vent, collected June 6 at Chichen Itzá. However, "two females taken on June 6 and 7 (Chichen Itzá) each had four large eggs in the body cavity."

Locality records.—YUCATAN: Chichen Itzá (EHT 9995–8; MCZ 7117 [2]; UMMZ 68203–8 [7], 68209 [4], 68210–3, 72896–72920, and 47 spec. without number); Xcach Aguada, 12 mi. S of Izamal (UMMZ 6); 14 km. N 2 km. E of Mérida; UMMZ 72927); Mérida (EHT 9999–10000); Telchac de Costa, N coast Yucatan (UMMZ 76159); Progreso (UMMZ 79471 [2]; AMNH 38870; CAS 54639–40; EHT 9982–94; MCZ 7124, 7254 [4]); 5 mi. inland from Vigia, Asunción Bay (UMMZ 78567 [4], 78568 [4]); 3 mi. NE Huanabchen (AMNH 38871); Huanabchen (AMNH 38872); Oxkutzcab (AMNH 38873–4); Calcehtok (AMNH 38875–6); San Ignacio (MCZ 7240); La Vega (USNM 47631); Puerto Morelos (USNM 47628–9); Piste (Gaige, 1936); Mujeres Island (USNM 47640–2; UMMZ 78565–6); Yucatan (USNM 24865–6). CAMPECHE: Champoton (UMMZ 72921–6); Ciudad del Carmen (EHT 13000–11); Balchacaj (EHT 13012–4); Tres Brazos (EHT 13015–9).

BRITISH HONDURAS: N. River (USNM 57005, J. Hurter, May 25, 1914).

Guatemala: (USNM 6787); near La Libertad (UMMZ 74957–63, 74964 [2], 74965 [2], 74966 [2], 74967 [3], 74968 [3], 74969 [2]).[1]

THE SINIFERUS GROUP[2]

Five species are included in the *siniferus* group: *carinatus* Smith, *cupreus* Bocourt, *ochoterenae* Smith, *siniferus* Cope, and *squamosus*

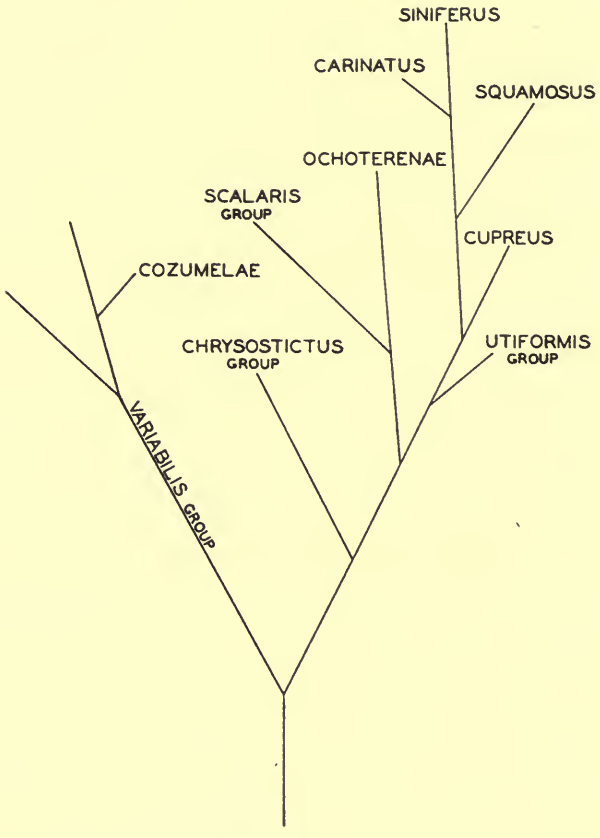

Fig. 48. Phylogeny of the *siniferus* group.

Bocourt. *Sceloporus cochranae* Smith I now find to be a synonym of *cupreus* Bocourt, and *fulvus* Bocourt a synonym of *squamosus* Bocourt.

[1] Cope (1900, p. 398) records *chrysostictus* from the city of Guatemala, from a specimen collected by Van Patten, doubtless in error. The specimen now in the National Museum from "Guatemala" was collected by H. Hague.

[2] Approximately 850 specimens examined.

The keeled preanal scales in the females characterize this group. A number of characters are typical of the group, and, in their combination, segregate these five species from others of *Sceloporus*. These characters are as follows: preanal scales keeled in females (insofar as known); postanals tending to be poorly developed (except *ochoterenae* and *cupreus*); two postrostrals (except *ochoterenae*, without postrostrals); dorsal scales large or medium in size (28 to 46); lateral scales in oblique rows, well differentiated from dorsal scales; ventral scales pointed or, at least not notched (except in *ochoterenae*, in which they are notched); scales on posterior surface of thigh small, but not granular; no postfemoral dermal pocket; males without distinctive ventral coloration (except *ochoterenae*); small or medium size of all species (maximum snout-vent measurement 71.2 mm.); and tail tapering, slender, much greater than body measurement.

It appears that the *chrysostictus-siniferus* groups arose from the stem of the *variabilis* group. *S. chrysostictus* appears to have diverged first from this stem, and the characters subsequently developed differ sufficiently from those of the *siniferus* group to establish it as a distinct section.

The most primitive species of the *siniferus* group seems to be *ochoterenae*. The keels on the preanal scales in females are poorly developed, the ventral scales are notched, there are no postrostrals, and the postanals are enlarged in males. These characters indicate a relatively remote relationship of *ochoterenae* with the other species of the group.

S. cupreus stands in a more or less central position with regard to the remaining species, both structurally and geographically. Apparently it (or its near ancestors) gave rise to *siniferus* and *squamosus*. The *siniferus* stem has undergone a further modification resulting in the development of the present *siniferus* and *carinatus*.

The general tendency in the group is toward reduction in number of dorsal scales. Primitive species show higher averages than the more recently developed forms. *S. squamosus* shows the greatest extreme in this direction. *S. carinatus*, while apparently recently differentiated, appears to have diverged from the *siniferus* stem before the development of the highly variable form of *siniferus* now existing. There appears to be a primitive relict population of *siniferus* in the highlands of Oaxaca.

All data available seem to support the above phylogenetic scheme, except for the fact that in the southern part of its range

squamosus shows the highest average dorsal scale count, and the lowest in the northern part, where the species representing the stock from which it was presumably derived exist at present. The primitive population apparently continued to migrate southward, while the genetically active population remained in the north.

The only obvious systematic problem remaining concerns the validity and stability of the *siniferus* population in the highlands of Oaxaca. It appears possible that another race exists in this area, but specimens available at present are insufficient to prove or disprove the point.

KEY TO SPECIES OF THE SINIFERUS GROUP

1.—Nasals and anterior internasals broadly in contact with rostral; no postrostrals; postanals enlarged in males; ventral scales notched. *ochoterenae* (p. 308)

Nasals and anterior internasals separated from rostral by two or more postrostrals; ventral scales not notched 2

2.—One canthal 3

Two canthals 4

3.—Femoral pores 11 to 12; dorsal scales 38 to 44 ..... *carinatus* (p. 303)

Femoral pores 3 to 6; dorsal scales 28 to 37 ..... *squamosus* (p. 319)

4.—Femoral pores 3 to 11; postanals not or slightly enlarged in males. *siniferus* (p. 313)

Femoral pores 12 to 14; postanals distinctly enlarged in males. *cupreus* (p. 305)

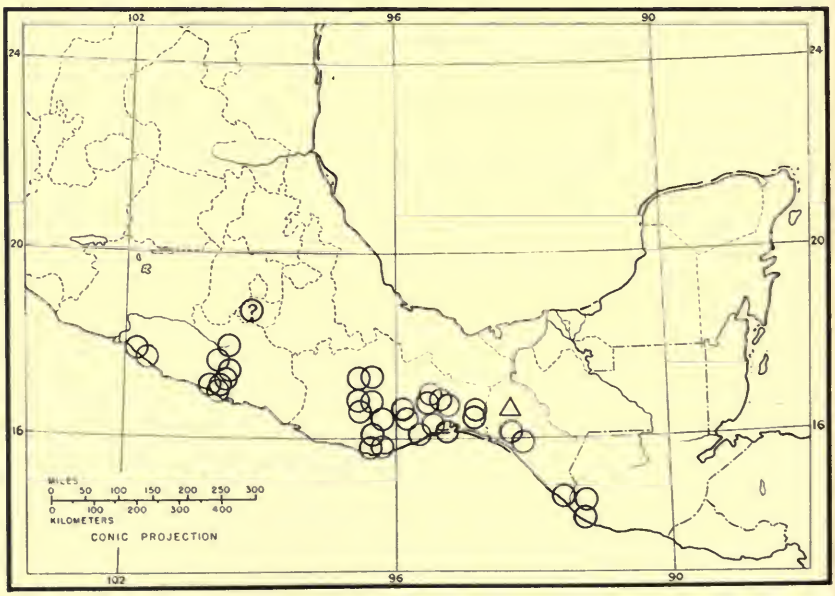

FIG. 49. Distribution of *Sceloporus carinatus*, ○; and *S. siniferus*, △.

Sceloporus carinatus Smith.

Sceloporus carinatus Smith, Proc. Biol. Soc. Wash., **49**, pp. 89–91, pl. 2, figs. 2, 3, 1936.

Type locality.—Tuxtla Gutierrez, Chiapas. Type EHT 15205, collected by E. H. Taylor and Hobart M. Smith.

Distribution.—Known only from the plateau of Chiapas (fig. 49).

Diagnosis.—Head scales strongly keeled, frontal ridges prominent; laterals in oblique rows; femoral pores 9 to 12, widely separated medially; one canthal scale; nasal separated from rostral; postanals in males very slightly enlarged; scales on posterior surface of thigh very small, but not granular; no postfemoral dermal pocket; dorsals 38 to 44 from occiput to base of tail, keeled and mucronate, about twice as large as lateral scales; labials imbricating; males uniform white below.

Description.—Dorsal head scales keeled or striated; frontal ridges very prominent, enclosing a depression; interparietal large, subtriangular in shape; a parietal on each side, each a little over one-third as large as interparietal; frontoparietals very broadly in contact medially; posterior section of frontal very small, about one-fifth or one-sixth as large as anterior section of frontal; latter divided longitudinally, its anterior edge about one and one-third times as wide as the posterior edge; a small median scale inserted between the prefrontals and frontal, separating the prefrontals but projecting only a short distance posteriorly between the halves of the frontal; median frontonasal large, in contact with median scale between prefrontals; lateral frontonasals subequal in size to medium frontonasal; three small scales behind nasal, separating the latter from the posterior internasals and lateral frontonasals; two pairs of large internasals, the scales of the anterior pair in contact medially and separating the posterior pair from the rostral; nasal more or less rectangular, the naris pierced in the extreme posterior end, leaving only a narrow posterior rim; anterior part of nasal about as large as actual opening of naris; a pair of broad scales separating nasals and internasals from rostral.

Supraoculars large, in a single series of five scales; row of scales between supraoculars and median head scales reduced, permitting several of the supraoculars to contact the median head scales; a single row of small scales between supraoculars and superciliaries (another incomplete row on one side); one large canthal; subnasal large; loreal single, square, somewhat smaller than subnasal; preocular divided, the lower part twice as large as the upper; a single

row of lorilabials, the scales keeled; about three and one-half upper labials to a point below middle of eye; fourth upper labial narrowly in contact with subocular posteriorly; infralabials long, about three to a point below middle of eye; only a single row of labiomentals, consisting of a series of very long, narrow scales, becoming increasingly narrow anteriorly, separated from mental by one-third or one-fourth the length of the first infralabial; three pairs of well-differentiated postmentals, the scales of the anterior pair in contact, separated in the others.

Several large, irregular scales behind parietals and interparietal; scales in temporal and median gular regions and in area between ear and nuchal pocket subequal in size; two very small, median auricular lobules, smaller than the preceding scales; lateral nuchal fold extremely deep; dorsal nuchals above fold in 10 longitudinal rows, not well differentiated from lateral nuchals; scales in axilla and groin squamous, not granular; dorsals 38 from occiput to base of tail, rather strongly keeled, moderately strongly mucronate; eight rows of dorsals between insertions of hind legs; lateral and ventral scales subequal in size, about one-half as large as dorsals; lateral scales not strongly differentiated from dorsals, and not so strongly keeled; ventral scales pointed, smooth (a slight indication of keels on preanal scales); ventral nuchal scales about one-half as large as median ventrals of abdomen.

Dorsal scales of foreleg subequal to lateral abdominal scales in size, carination, and mucronation; ventral scales of same member keeled and mucronate, those of upper foreleg smaller than those of lower foreleg, and about one-half size of dorsal scales of same member; lamellar formula for fingers 6–11–16–17–9 (7–11–16–17–10).

Dorsal scales of hind leg and back subequal; ventral scales of hind leg smooth, those of shank almost as large as dorsals of same member, rounded at tips; ventral scales of thigh about one-half or one-third size of dorsals of same member, mucronate; scales on posterior surface of thigh one-third to one-fourth size of preanal scales, smooth except in a small median area; no postfemoral dermal pocket; lamellar formula for toes 8–11–16–22–12 (8–11–17–22–13); postanals not noticeably enlarged; subcaudals keeled almost to anus. Preanals keeled in females.

Color.—An indistinct slate-colored band passing from posterior margin of eye above arm to groin and onto tail, very indistinctly broken into spots on sides of body; a narrow light line, slightly tinged with pink, passing from upper edge of lateral nuchal pocket

to shoulder; above lateral dark line a very indistinct narrow lighter line of a greenish cast, passing from region above ear to base of tail; between these lines a broad dull brown band, with a series of V-shaped black marks in the middle, their apices caudad; these marks more distinct posteriorly and light bordered, apparently fusing into a median dark band anteriorly, disappearing on neck; head brown, with a slight reddish tinge; legs rather distinctly banded; two small round orange-colored spots on posterior surface of thigh; ventral surfaces white, with a suffusion of slate on sides of abdomen, anteroventral surface of thigh and on ventral surface of tail.

Comparisons.—This species apparently is most closely related to *S. squamosus*, from which it differs by having a larger number of femoral pores, larger number of dorsal scales, postanals not distinctly enlarged in males and ten longitudinal rows of dorsal scales on neck and back (eight in *squamosus*). *S. siniferus* differs from this species by having a smaller number of femoral pores, two canthal scales, dorsal scales in eight longitudinal rows, and less distinctly mucronate ventral scales. *S. chrysostictus* differs from this species in having a different coloration, more numerous femoral pores, more rows of dorsal scales across rump, tail not constricted near base, scales on posterior surface of thigh much larger, canthal not so large when single, interorbital region not strongly ridged, labiomentals not so narrow, and in numerous other characters. *S. cupreus* differs in having the lateral nuchal scales much smaller than and strongly differentiated from dorsal nuchal scales, postanals distinctly enlarged, and two canthal scales.

Habits and habitat.—The type was discovered running about in high grass on the side of a low mountain four or five miles south of Tuxtla Gutierrez.

Locality records.—CHIAPAS: Tuxtla Gutierrez (AMNH 58053; EHT 15205, 15282–84).

Sceloporus cupreus Bocourt.

Sceloporus cupreus Bocourt, Ann. Sci. Nat., Zool., (5), **19**, No. 4, p. 3, 1873; idem, in Duméril, Bocourt, and Mocquard, Miss. Sci. Mex., Zool., **3**, sec. 1, pp. 210–212, pl. 18bis, figs. 2, 2 *a*, 2 *b*, 1874; Smith, Occ. Papers Mus. Zool. Univ. Mich., **358**, pp. 6–9, 1936.

Sceloporus cochranae Smith, Proc. Biol. Soc. Wash., **49**, pp. 87–89, pl. 2, 1936—Mt. Zempoaltepec, Oaxaca, Mexico (type USNM 47605, collected by Nelson and Goldman).

Type locality.—Oaxaca.

Distribution.—The highlands of central Oaxaca (fig. 50).

History.—See discussion under *teapensis*.

Diagnosis.—A small species of *Sceloporus*, maximum known snout-vent measurement 52 mm.; dorsal scales 42 to 44; ventral scales about 47; scales around body about 47; ventral scales smooth, not notched; lateral scales in oblique series, strongly differentiated

FIG. 50. Distribution of *Sceloporus ochoterenae*, ○; and *S. cupreus*, ▽.

from dorsals; two canthal scales; two postrostrals; no postfemoral dermal pocket; scales on posterior surface of thighs very small; femoral pores 12 to 14; postanals enlarged in males; subcaudals keeled; venter in males uniform white or cream.

Description.[1]—Head scales rugose; supraoculars five, the anterior three in contact with the median head scales; two to three incomplete rows of scales between supraoculars and superciliaries; interparietal three times as large as either parietal, triangular; parietal long; frontoparietals small, rounded, broadly in contact medially; frontal divided both transversely and longitudinally; prefrontals narrowly in contact; frontonasals three, subequal in size, the laterals in contact with canthals; two pairs of internasals, the posterior pair slightly smaller; two large, transversely elongate scales posterior

[1] Based on type of *S. cochranae*.

to rostral, separating nasals and internasals from rostral; two canthals, the anterior not touching the lorilabials and the posterior forming but a very small portion of the superciliary series; loreal and subnasal present; preocular represented by a small scale segmented from lower anterior edge of subocular; the latter contacts the second canthal above, separating preocular from second canthal; a single row of lorilabials, complete under subocular, composed of long, imbricate scales; upper labials four to a point below middle of eye, elongate, imbricating anteriorly, as do also the lorilabials; lower labials five to a point below middle of eye, imbricating posteriorly; labiomental scales normal, not lengthened extremely; postmentals normal, the scales of the anterior pair in contact with each other medially and with the first infralabial laterally; the other postmentals separated medially, gradually decreasing in size posteriorly.

Two auricular lobules on each side, slightly smaller than preceding scales; lateral nuchal fold not surmounted by enlarged scales; scales in temporal region three or four times as large as those between ear and foreleg; scales in the latter region even smaller than or subequal in size to those in axilla; dorsal scales keeled, not or very weakly mucronate, in about 15 rows across neck, distinctly differentiated from lateral nuchal scales, which are much smaller; lateral scales on body smaller than dorsals or ventrals, more weakly keeled than dorsals; ventrals slightly smaller than dorsals, slightly larger than laterals, not keeled or mucronate, not notched; no postfemoral dermal pocket; dorsals in ten rows between hind legs; dorsal caudals at base of tail slightly larger than dorsals on body, more strongly keeled; enlarged postanals present; tail strongly constricted behind base, round in cross section; subcaudals strongly keeled posterior to basal constriction.

Scales on dorsal surface of foreleg weakly keeled distally, more strongly keeled proximally, those on upper foreleg somewhat larger than those on lower foreleg, subequal in size to dorsals of body; ventral scales of humerus very small, about equal in size to axillary scales, keeled; ventral scales of lower foreleg subequal in size to dorsals of the same member, smooth; lamellar formula for fingers, 7–?–17–17–10 (8–?–?–17–10); dorsal scales of hind leg subequal in size, strongly keeled, weakly mucronate, slightly larger than dorsals of body; scales on posterior surface of thigh very small, much smaller than preanals, keeled; ventral scales of shank almost as large as dorsals of same member; lamellar formula for toes ?–13–17–21–14 (7–12–?–21–14).

Color.—A broad dark brown lateral band extending from temporal region onto base of tail; above this a broad blue-green band from temporal region onto tail, sharply distinct from dark lateral band; a broad median brownish band from occiput to tail, about five scale rows wide in middle of back, narrower on tail and not sharply defined from dorsolateral light band; ventral surfaces whitish, without distinctive lateral abdominal coloration; gular region with indistinct broad convergent gray-blue bars, fading completely toward middle of throat; top of head brown.

Remarks.—Some data on variation in *cupreus* is given in the discussion under *teapensis.*

One of the most distinctive characters of this species is the small size of the lateral nuchal scales, which character separates it from other species of the *siniferus* group. In this character it resembles various species of the *variabilis* group, from which *cupreus* is distinguished by lacking a postfemoral dermal pocket. *S. squamosus* and *carinatus* differ in possessing fewer femoral pores and a single canthal; *siniferus* has fewer femoral pores and no enlarged postanals in males; *chrysostictus* has large scales on the posterior surface of the thigh, smooth subcaudals (males), its lateral nuchal pocket differently placed, and lacks a sharp constriction near the base of the tail; *jalapae, ochoterenae,* and *maculosus* have more numerous femoral pores, closely approximated medially.

Locality records.—OAXACA: Mt. Zempoaltepec (USNM 47605); Oaxaca (Bocourt).

Sceloporus ochoterenae Smith.

Sceloporus scalaris Bocourt, Miss. Sci. Mex., Zool., **3**, sec. 1, pp. 202–205, 1874 (part); Cope, Proc. Amer. Phil. Soc., **22**, pp. 396, 397, 1885 (part); idem, Bull. U. S. Nat. Mus., **32**, p. 36, 1887 (part); Günther, Biol. Cent.-Amer., Rept. Batr., pp. 73–74, 1890 (part); Gadow, Proc. Zool. Soc. Lond., **2**, pp. 195, 214, 230, 232, 1905 (part).

Sceloporus ochoterenae Smith, Trans. Kans. Acad. Sci., **37**, pp. 269–273, pl. 9, figs. 6, 9, pl. 10, fig. 12, 1934; idem, Proc. Biol. Soc. Wash., **49**, p. 89, 1936.

Sceloporus aeneus(?) Ahl, Zool. Anz., **106**, p. 184, 1934.

Type locality.—Two miles north of Mazatlán, Guerrero. Type EHT 7158, collected by Edward H. Taylor and Hobart M. Smith.

Distribution.—Known only from Guerrero, Morelos, and the Distrito Federal (fig. 50).

Diagnosis.—A small *Sceloporus,* maximum snout-vent measurement about 55 mm.; dorsal scales 38 to 46, average 42.4; ventral

scales 45 to 55, average 50.2; scales around body 43 to 55, average 49.4; femoral pores 10 to 16, average 13.5; femoral pore series separated medially by two to six scales; preanal scales keeled in females; scales on posterior surface of thighs much smaller than preanal scales, but not granular; head scales rugose or keeled; two canthals; nasals and two large internasals in contact with rostral; no postrostrals; three or four large scales on anterior border of ear, not so large as in *jalapae*, the median not greatly enlarged; tibia longer than shielded part of head; length of fourth toe from base of

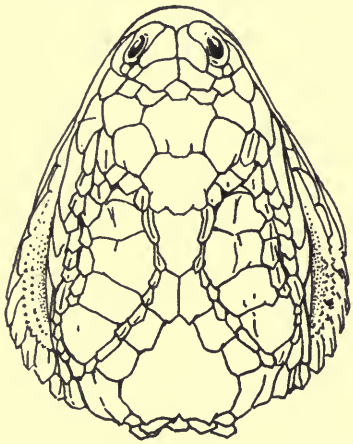

FIG. 51. Head scales of *Sceloporus ochoterenae*.

fifth about equal to distance from snout to lateral neck fold; postanals enlarged in males.

Description.—Head scales weakly rugose or keeled; frontal ridges weak; interparietal very large, about two-thirds size of supraorbital area; a single parietal on each side (rarely two), about one-eighth size of interparietal; two to five frontoparietals, usually three; frontoparietals usually in contact medially; frontal transversely divided, the anterior section occasionally longitudinally divided; usually four enlarged supraoculars, separated from superciliaries by one complete and one or two incomplete rows of small scales; a row, frequently incomplete, of small scales between supraoculars and median head scales; prefrontals usually separated medially by contact of median frontonasal and frontal; median frontonasal in contact with lateral frontonasals, about one and one-half or one and two-thirds size of lateral scales; usually three pairs of internasals, two anterior pairs regularly present; anterior pair of

internasals in contact with rostral; nasal large, elongate, in contact with rostral, the area occupied by naris about one-half total area of scale; no postrostrals; subnasal always present, subequal in size to canthal scales, or larger; two canthals, the anterior never in contact with lorilabials, rarely forced above canthal ridge by contact of second canthal and subnasal; usually one loreal, occasionally none, one or three; preocular usually entire, frequently divided; subocular elongate, followed by three postoculars; usually the two rows of lorilabials reduced to one row below subocular by contact of one or more scales with both subocular and supralabials; three and one-half supralabials and four infralabials to a point below middle of eye.

Mental as long as broad, pentagonal, its labial border about two-fifths that of rostral; three to five postmentals in a series behind mental; outer row of labiomentals terminating anteriorly between first postmental and first infralabial; gular scales keeled, becoming smaller and keeled posteriorly at sides of neck; anterior gular scales smaller than scales posterior, rounded, others notched.

Auricular lobules four or five, pointed, smooth, none greatly enlarged, the largest scales larger than preceding scales; scales in temporal region keeled, not or weakly mucronate, smaller than largest scales between ear and lateral nuchal fold; latter scales more strongly keeled and mucronate, denticulate; scales in axilla granular; a series of granular scales extending from axilla above arm into nuchal pocket; scales above and below this series, between arm and nuchal pocket, larger, the ventral scales larger than scales bordering the series of granules above.

Dorsal scales keeled, mucronate, weakly denticulate, in parallel rows; lateral scales similar in character to dorsal scales, about one-half or one-third as large; ventral scales somewhat smaller than lateral scales, smooth, notched (preanal scales entire); median ventral scales smaller than lateral abdominal and preanal scales.

Dorsal scales of foreleg keeled, mucronate, subequal in size, about one-half size of dorsal scales on body; ventral scales of lower foreleg about two-thirds size of dorsals of same member, those on median and posteroventral surfaces keeled and mucronate, those on anteroventral surface smooth; ventral scales on upper foreleg smooth, rounded or weakly notched, smaller than ventrals of lower foreleg, but gradually increasing in size distally; lamellar formula for fingers 7–11–16–16–10 (7–11–16–?–10).

Dorsal scales of hind leg keeled, weakly mucronate, weakly denticulate, those on shank slightly larger than those on thigh,

somewhat smaller than dorsal scales on body; scales on anterior surface of thigh smooth, becoming smaller on ventral surface toward femoral pore series; scales on posterior surface of thigh very small, imbricate, smooth, about one-fourth size of preanal scales; ventral scales of shank smooth, rounded or weakly notched, subequal in size to dorsal scales of same member; lamellar formula for toes 7–12–16–20–13 (7–11–16–20–14).

Dorsal caudal scales strongly keeled, mucronate, weakly denticulate, somewhat larger than dorsal scales on body; subcaudals smooth in males, becoming keeled toward tip of tail; subcaudals keeled in females at base of tail, becoming smooth distally, then keeled; preanals distinctly keeled in females, smooth in males; enlarged postanals present in males; no postfemoral dermal pocket.

Color.—Head in males light grayish-blue; a black spot on shoulder; a bright narrow black line extending from posterior margin of orbit to upper edge of tympanum, continued posteriorly onto sides of tail as a broad band, and breaking up into a series of large black spots on the sides between fore and hind legs; these spots bordered above by a light blue line, broad and of indefinite outline posteriorly, narrow and distinct above forelegs; a broad median bluish band, darker than lateral light bands bordering it; a series of about 11 small black spots on each side near the edge of the median dorsal band; limbs grayish, banded with black; tail light bluish; sides of abdomen on venter bluish, darker toward median edges, with some suffusion of pinkish; sides of body below lateral light spots and above blue on sides of abdomen greenish-blue, more or less iridescent, stippled with black; chest and ventral surfaces of limbs white; tail very light lavender below; throat, in posterior region, moderately dark blue; chin whitish.

In some males the whole body is rusty in appearance, and the markings are very faint, if evident at all. The small black marks on the edge of the median band are usually rather faint. The limbs are frequently very strongly banded with black and whitish, while in some specimens the bands are faint. The lateral dark spots are evident in all except a few extremely dark males.

The color pattern of females in no way resembles that of the males. The whole dorsal surface is brownish, lighter on the head. A series of eleven or twelve rather broad, undulating crossbars on each side of the back, separated medially by three or four scales. If the lateral light line below the crossbars is visible at all, it is only above the forearms; this line fades out almost completely before reaching

the sacral region. In some specimens the sides of the body are dark, in others they are grayish, but no spots are apparent. The shoulder mark is absent. The limbs are, as in males, distinctly banded in some, in others, not. The venter is whitish, sometimes bluish; the lower labial and lateral gular region may be banded.

Variation.—The following data on scutellation of the head are derived from the examination of 50 specimens. Parietals one or two (1, ninety-seven; 2, three); frontoparietals two to five on each side (2, eight; 3, seventy-six; 4, thirteen; 5, one); frontal touches interparietal in three; frontoparietals contact medially in 44, separated by an azygous scale in three; frontal entire in one, anterior section longitudinally divided in seven, posterior section transversely divided in three, longitudinally in two; superciliaries six (seven on one side in one); supraoculars four or five (4, ninety-six; 5, four); one to four supraoculars in contact with head scales in 23 (any one or a combination of any of the four supraoculars may contact median head scales); prefrontals contact medially in seven, separated by an azygous scale in 13; median frontonasal in contact with frontal in 30; median frontonasal separated from lateral frontonasals on one side in four; nasal and anterior pair of internasals in contact with rostral in all; no postrostrals; two pairs of internasals regularly present, followed posteriorly by three scales in six, by another pair in 36, by a single scale in seven; canthals one on one side in one (fused); first canthal forced above canthal ridge by contact of second canthal and subnasal on one side in one; preocular divided on both sides in 18, on one side in four; loreals none to three (none, two [fused with preocular]; 1, eighty-two; 2, fifteen; 3, one); rows of lorilabials below subocular complete on both sides in one, reduced to one row by one or more scales in contact with both subocular and supralabials in the others.

Dorsal scales 38 to 46, average 42.4 (50 counts: 38, one; 39, two; 40, five; 41, nine; 42, six; 43, twelve; 44, nine; 45, three; 46, three); ventral scales 45 to 55, average 50.2 (50 counts: 45, two; 46, one; 47, three; 48, seven; 49, four; 50, eight; 51, nine; 52, eight; 53, three; 54, four; 55, one); scales around body 43 to 55, average 49.4 (50 counts: 43, one; 44, one; 45, two; 46, five; 47, eight; 48, eight; 49, eleven; 50, four; 51, four; 52, three; 53, one; 54, one; 55, one). Femoral pores 10 to 16, average 13.5 (100 counts: 1, one; 11, five; 12, eleven; 13, thirty-four; 14, thirty; 15, fourteen; 16, five).

There is no apparent geographical correlation with the variations noted.

Habits and habitat.—The specimens collected north of Mazatlán were found running about in leaves in ravines. The temperature was rather low and the sky cloudy, so it is possible that they were more restricted in their movements than usual. However this may be, all were taken on the ground, frequently found by raking away piles of wind-accumulated leaves. The brownish color of the males concealed them among the similarly colored leaves.

Locality records.—GUERRERO: Chilpancingo (SDSNH 16310–3; MCZ 33801–49, 33850 [26]; UMMZ 72418 [4]; EHT 7198–7204); Balsas (FMNH 1010; EHT 7148–9, 7196–7); 11–12 mi. S of Puente de Ixtla, Morelos (EHT 7134–44, 7147, 7184–91); S of Taxco (EHT 7192–3); 16 km. N of Rio Balsas (EHT 7194–5); Salto de Valadez, 16 km. S of Chilpancingo (EHT 7205–7); 2 mi. N of Mazatlán (12 mi. S of Chilpancingo) (EHT 7150–79); Acuitlapan (EHT 7145–6); between Cajones and Acahuitzotla (EHT 7180) Tierra Colorada (Gadow, 1905). MORELOS: 5 mi. S of Puente de Ixtla (EHT 7181); 15 km. S of Cuernavaca (EHT 7182–3) Cuernavaca (Bocourt, 1874). DISTRITO FEDERAL: Coyoacán (MCZ 7475).

Sceloporus siniferus Cope.

Sceloporus siniferus Cope, Proc. Amer. Phil. Soc., **11**, pp. 159–160, 161, 1869; idem, Ann. Rept. Peabody Acad. Sci., **3**, p. 82, 1871; Sumichrast, Bibl. Univ. Rev. Suisse, **46**, p. 243, 1873; Bocourt, Miss. Sci. Mex., Zool., **3**, sec. 1, p. 208, 1874; idem, Ann. Sci. Nat., Zool., (6), **3**, No. 12, p. 4, 1876; idem, Jour. Zool., Paris, **5**, pp. 401, 402, 1876; Sumichrast, Bull. Soc. Zool. France, **5**, pp. 163, 164, 177, 1880; idem, Naturaleza, **6**, p. 38, 1882; Cope, Proc. Amer. Phil. Soc., **22**, pp. 394, 396, 1885; Boulenger, Cat. Liz. Brit. Mus., **2**, pp. 218, 237, 1885; Cope, Bull. U. S. Nat. Mus., **32**, p. 35, 1887; Günther, Biol. Cent.-Amer., Rept. Batr., p. 76, 1890; Boettger, Kat. Rept. Senck.-Mus., p. 65, 1893; Cope, Amer. Nat., **30**, p. 1024, 1896; Boulenger, Proc. Zool. Soc. Lond., **1897**, pp. 515, 520, 1897; Cope, Ann. Rept. U. S. Nat. Mus., **1898**, pp. 333, 334, 338, 1900; Gadow, Proc. Zool. Soc. Lond., **2**, pp. 195, 232, 1905; idem, Zool. Jahrb., Syst., **29**, p. 706, 1910; Mertens, Abh. Ber. Mus. Naturk. u. Naturw. Ver. Magdeburg, **6**, p. 158, 1930; Gadow, Jorullo, p. 50, 1930; Burt, Trans. Amer. Micr. Soc., **54**, p. 173, 1935; Smith, Proc. Biol. Soc. Wash., **49**, p. 91, 1936; Hartweg and Oliver, Occ. Papers Mus. Zool. Univ. Mich., **356**, pp. 6–7, 1937.

Sceloporus humeralis Bocourt, Ann. Sci. Nat., Zool., (5), **17**, No. 10, p. 2, 1873 —Oaxaca; idem, Miss. Sci. Mex., Zool., **3**, sec. 1, pp. 206–208, pl. 18bis, figs. 3, 3 *a*, 3 *b*, 1874.

Type locality.—Pacific side of the isthmus of Tehuantepec. Cotypes(?) USNM 30453–71.

History.—Bocourt's *Sceloporus humeralis* was described with the assumption that Cope's *siniferus* possessed normally enlarged post-

anal scales and normal sexual dimorphism in the coloration of the belly, since their absence is so remarkable, and was not mentioned by Cope in his original description. Bocourt's specimen is, however, apparently typical of *siniferus*.

Distribution.—Western Guerrero along the Pacific slope to extreme western Guatemala; inland as far as the city of Taxaca and perhaps to Cuernavaca (fig. 49).

Diagnosis.—A *Sceloporus* of moderate size, maximum snout-vent measurement 71.2 mm.; head scales weakly rugose; dorsal scales 31 to 46 from occiput to base of tail, average 37.4; ventral scales 31 to 52, average 40.9; scales around body 35 to 57, average 42.5; dorsal scales strongly keeled, mucronate; lateral scales about one-third size of dorsals, subequal in size to median abdominal scales; scales on posterior surface of thigh small, about three-fifths to three-fourths size of preanals; no postfemoral dermal pocket; subcaudals keeled in both males and females; preanals keeled in females; lateral nuchal pocket not in contact with lateral scales of the dorsal series; canthals two; subnasal present; anterior section of frontal longitudinally divided, posterior section frequently; femoral pores three to eleven, usually five or six; postanals not enlarged in males; no sexual dimorphism in belly coloration, both sexes dusky below.

Description.—Head scales rugose, more distinctly in large specimens; interparietal subtriangular in shape, about four times as large as either parietal; parietals usually single on each side, occasionally divided into two; frontoparietals single on each side, broadly in contact medially; posterior section of frontal usually longitudinally divided, anterior section always longitudinally divided; supraoculars four to six, usually five; a row of small scales separating supraoculars from median head scales, rarely incomplete; usually one complete row of small scales between supraoculars and superciliaries, occasionally two incomplete rows; five superciliaries visible from above; prefrontals separated by an azygous scale; frontonasals usually normal in position, the median frontonasal occasionally separated from lateral frontonasals; generally two pairs of internasals, the scales of the posterior pair inserted between the scales of the anterior pair, usually in contact with row of scales behind rostral; nasal separated from rostral by a row of small scales (abnormally in contact with rostral); two canthals and one subnasal present; first canthal very rarely forced above canthal ridge by contact of second canthal and subnasal; preocular almost always divided; loreal single, rarely

double; one row of keeled, usually anteriorly imbricating lorilabials; subocular large, keeled, followed posteriorly by two or three keeled postoculars; supralabials anteriorly imbricating, three and one-half to four and one-half to a point below middle of eye; infralabials posteriorly imbricating, three and one-half or four to a point below middle of eye.

Mental short, pentagonal, with a labial border about one-half that of rostral; a series of four or five postmentals on each side, the first scales in contact medially; outer row of labiomentals terminating anteriorly between first postmental and first infralabial, composed of scales imbricating posteriorly; inner row of labiomentals short, terminating anteriorly at about a point below suture between second and third infralabial; gular scales smooth, rhomboidal, pointed; median gular scales larger than lateral gular scales; ventral scales between ear and lateral nuchal pocket weakly keeled.

Auricular lobules very small, smaller than preceding scales; temporal scales keeled, not mucronate, larger than any scales between ear and arm; all scales on side of neck and on shoulder keeled, pointed; scales in a small area behind ear and above arm smaller than other scales on side of neck; lateral nuchal pocket devoid of accessory folds, separated from lateral dorsal scales by six or seven rows of scales increasing in size toward dorsal series, and not distinctly differentiated from latter.

Dorsal scales strongly keeled, mucronate, in nearly parallel rows (one or two rows usually dropping out near middle of back or shoulders); lateral scales rather distinctly differentiated from dorsal scales in males, less in females, about one-fourth to one-third size of dorsals, keeled, mucronate; ventral abdominal scales smooth, somewhat pointed, in divergent rows; scales on chest similar, but somewhat smaller; preanal scales somewhat smaller than ventral abdominals, smooth in males, keeled in females; interfemoral scales somewhat mucronate, very weakly keeled in males, more strongly in females.

Dorsal scales of foreleg keeled, mucronate, those on upper foreleg subequal in size to smallest median lateral scales on body (somewhat smaller in females), those on lower foreleg somewhat smaller; ventral scales on lower foreleg about three-fourths size of dorsals of same member, keeled; scales on anterior surface of lower foreleg very weakly keeled or smooth; ventral scales on upper foreleg about one-fourth size of ventrals on lower foreleg, smooth medially, keeled anteriorly and posteriorly; lamellar formula for fingers 6–11–16–15–8 (6–11–16–16–9).

Dorsal scales of hind leg strongly keeled, mucronate, those on shank about one and one-third times size of those on thigh, and about three-fourths or four-fifths size of median dorsal scales on body; scales on thigh becoming smaller on anterior and ventral surfaces toward femoral pore series; ventral scales near femoral pore series mucronate, very weakly keeled; scales on posterior surface of thigh keeled, not mucronate, about three-fifths to three-fourths size of preanal scales; scales on medial ventral surface of shank somewhat smaller than dorsal scales of same member, smooth; posteroventral and anteroventral shank scales keeled; lamellar formula for toes 7–12–16–21–12 (7–12–16–21–13).

Dorsal scales on tail very strongly keeled, strongly mucronate, somewhat larger than median dorsal scales on body; subcaudals keeled and mucronate in both males and females; postanals not differentiated; postfemoral dermal pocket absent.

Color.—The males of medium size are dark dull brown above, with a series of seven to ten indistinct darker brown chevron-shaped marks on the back, each mark with a light posterior border. The marks are usually split in the middle. A dorsolateral light stripe, originating at the posterior corner of the eye, passes along each side to the base of the tail; it is indistinct on the sides of the head. The median border of the light stripe is indefinite, the outer border very distinct; sides of body very dark brown or black, heavily mottled with small light spots, the latter sometimes arranged in narrow diagonal lines. A black spot on the shoulder, with light anterior and posterior borders, may or may not be present. Occasionally the light borders are present, but the area between is mottled like the sides of the belly. The limbs have dark brown bands, the distal borders of which are usually black, light-edged. The tail has dark brown chevron-shaped marks. The labial region is usually very distinctly barred, the bars passing onto the gular region and converging medially. The outer sides of the belly are gray, with small white spots. The posterior surface of the thigh may have large white spots.

Older males are more dull-colored, tending to lose the darker markings and the dorsolateral light stripe; younger males usually have the markings more distinct and brilliant, lacking, however, much of the mottling and dusky appearance of the belly.

Females have a lighter general ground color; the markings on the back are more distinct, the dorsolateral stripes less distinct; the ventral markings are quite variable, the entire throat nearly black

in one specimen; in this specimen the belly is heavily suffused with dark gray, the chest, limbs, and tail mottled black and white.

Very young specimens are uniform light buff above, becoming slightly more brownish on head; sides of body brownish; no dorsolateral light lines; spots on back absent.

Variation.—Unless otherwise stated, the following data are derived from the examination of 56 specimens from various localities in Guerrero, Oaxaca, and Chiapas. Parietal divided into two scales in five specimens; posterior section of frontal not divided in ten; one or both scales of the posterior pair of internasals not in contact with row of scales behind rostral in eight specimens; one pair of internasals in one; nasal contacts rostral in one (abnormal); first canthal forced above canthal ridge in two (129 examined); preocular entire in one specimen.

The scutellation of the head is, apparently, fairly constant. However, the scale counts of the body and the femoral pore counts vary considerably. It is notable that the highest averages occur in Oaxaca. The specimens from the Oaxaca highlands show the greatest extremes in high counts of all characters; specimens from Guerrero show the greatest extremes in low counts of all characters except femoral pores; in most respects the Chiapas specimens are intermediate in averages between the Guerrero and Tehuantepec specimens, but approach more closely averages of specimens from the latter area. The variation in scale counts is set forth in the following table.

VARIATION IN BODY SCALE COUNTS OF SCELOPORUS SINIFERUS COPE

Characters	*Sex*		*Guerrero*	*Oaxaca*	*Tehuantepec*	*Chiapas*
Dorsals	Female	Specimens	29	2	27	19
		Range	32–39	42–44	34–46	32–39
		Average	35.4	43.0	39.6	35.3
	Male	Specimens	34	2	51	7
		Range	31–39	39–43	35–44	35–40
		Average	34.8	41.0	39.6	37.1
Ventrals	Female	Specimens	28	2	27	15
		Range	34–45	46–51	35–48	33–43
		Average	37.9	48.5	42.0	37.9
	Male	Specimens	33	2	45	7
		Range	31–48	45–49	35–52	38–45
		Average	38.8	47.0	43.3	40.9
Around body	Female	Specimens	28	2	27	13
		Range	35–44	49–51	38–48	37–50
		Average	38.3	50.0	43.7	41.5
	Male	Specimens	33	2	51	9
		Range	35–45	49–57	40–53	39–46
		Average	40.1	53.0	45.4	42.1

Remarks.—A number of locality records available are rather doubtful or positively erroneous. A specimen in the Museum of Comparative Zoology (No. 32430) purports to be from Vera Cruz, collected by Steindachner in 1874. A series in the Museum of Zoology, University of Michigan (No. 67688 [5]) is recorded from Alvarez, San Luis Potosí, collected by W. W. Brown. The specimens in the accompanying list, recorded from Cuernavaca, Morelos, may also have incorrect locality data, since the species has not been collected there by others despite a rather extensive survey of the region. I also doubt the locality data for FMNH 2062 [3] supposed to have been collected in "Nicaragua."

Habits and habitat.—The species seems to inhabit more or less open country; it is infrequently found in wooded areas. A young specimen was collected by Hartweg and Oliver at Tehuantepec, Oaxaca, on August 26, 1936. A female with six large eggs in the oviducts was collected July 10; and others which apparently had oviposited were collected July 1 and July 9. Gadow (1910) states that *siniferus* reaches an elevation of 3,000 feet. At Oaxaca, Oaxaca, the elevation attained is considerably greater—some 5,067 feet.

Locality records.—GUERRERO: 2–3 km. S of Acahuitzotla (EHT 7392A, 7392–4); Acapulco (EHT 7415–7; USNM 46754, 46756–9, 46891–4; LMK 7354–7; LAM 4; AMNH 18040–3, 18394, 18396–8); Laguna Coyuca, near Acapulco (WM, several); 4 mi. N of Acapulco (EHT 7418–26); 8 mi. N of Acapulco (EHT 7427–31); (?)Rio Balsas (EHT 7432); Barranca de Santa Cruz (AMNH 18558–66); Buena Vista (Gadow, 1905); El Treinta (EHT 7414, 7426A); 2 mi. S of Gavapata (EHT 7334–5); Omilteme (Günther, 1890); 1 mi. N of Organos (EHT 7336–40); from Pacific Camp to San Luis (Gadow, 1905); Petatlan (LMK 10142–51); Petatlan Bay (LMK 4343–8); between Rincon and Cajones (EHT 7342–50, 7395–7411); Tierra Colorada (EHT 7351–2, 7389–91; WM, several); Xaltianguis (EHT 7412–3); Zihuatenejo (LMK 7350–3). MORELOS: Cuernavaca (MCZ 33913–4, W. W. Brown. OAXACA: Cafetal Concordia (Mertens, 1930); Chivela (MCZ 28230–64 [42]; USNM 47337; AMNH 18017); Chacalapa (AMNH 18769–76); Ejutla (AMNH 18600); Huilotepec (USNM 46995–6); Ixtepec (San Geronimo) (EHT 7357–62; FMNH 1471 [14]); Monte Alban (EHT 7353–4); Mixtequillo (AMNH 19357–61, 19372–3; CAS 73471–505); Miahuatlan (AMNH 18720, 18726–33, 18821); Oaxaca (USNM 47399–401); Puerto Angel (USNM 47847–8); Salina Cruz (USNM 25781; AMNH 18002–16, 18390–3, 18405, 19205, 19216, 19219); 4 mi. E of Salina Cruz (AMNH

18020–38); Santiago (AMNH 18358–63); San Mateo del Mar (Gadow, 1905); (?)San Carlos Yautepec (Gadow, 1905); San Pablo Mitla (AMNH 18515); Santa Efigenia (USNM 47810); Santo Domingo (USNM 47335); Santo Domingo de Guzman (Boettger, 1893); Tequesixtlan (Gadow, 1905); Tapanatepec (UMMZ 78852 [7]; MCZ 28326–75 [19]; SDSNH 16307); Tangolunda (LMK 7358–65); Tangola Bay (LMK 10132–40); Totolapan (EHT 7355–6); Tehuantepec (USNM 30453–71, 46990–3; UMMZ 28; AMNH 58052; MCZ 32347); river plains, 1½–2 mi. N of Tehuantepec (UMMZ 1); San Blas, 2 km. SE of Tehuantepec (UMMZ 3); Cerro de Las Tres Cruces, 32 km. SW of Tehuantepec (UMMZ 1); laguna 3 mi. NE of Tehuantepec (UMMZ 2); between Tehuantepec and Mt. Guengola (8 km. NW) (UMMZ 31); Mt. Guengola (AMNH 15982–3); between Santa Rosa and Tehuantepec (16 km. SW) (UMMZ 2); San Pedro Mt., 24 km. W of Tehuantepec (UMMZ 2); 4 mi. N of Tehuantepec (AMNH 18046–9). CHIAPAS: Tonalá (EHT 7363–88); San Benito (USNM 47516–7); (?)Mojarras (AMNH 58052).

GUATEMALA: Retalhuleu: Caballo Blanco (FMNH 1968 [3]); Champerico (CAS 68358–75).

Sceloporus squamosus Bocourt.

Sceloporus scalaris Hallowell, Proc. Acad. Nat. Sci. Phila., **1860**, p. 482, 1861—Nicaragua.

Sceloporus squamosus Bocourt, Miss. Sci. Mex., Zool., **3**, sec. 1, pp. 212–214, pl. 18bis, figs. 7, 7 *a*, 7 *b*, 7 *c*, pl. 19, fig. 3, 1874; idem, Ann. Sci. Nat., Zool., (6), **3**, No. 12, p. 4, 1876; idem, Jour. Zool., Paris, **5**, p. 402, 1876; Sumichrast, Bull. Soc. Zool. France, **5**, pp. 163, 176, 1880; idem, Naturaleza, **5**, p. 280, 1881; Cope, Proc. Amer. Phil. Soc., **22**, pp. 394, 396, 1885; Boulenger, Cat. Liz. Brit. Mus., **2**, pp. 218, 238, 1885; Müller, Verh. Naturf. Ges. Basel, **7**, p. 712, 1885; Cope, Bull. U. S. Nat. Mus., **32**, p. 35, 1887; Günther, Biol. Cent.-Amer., Rept. Batr., p. 77, 1890; Boulenger, Proc. Zool. Soc. Lond., **1897**, p. 521, 1897; Cope, Ann. Rept. U. S. Nat. Mus., **1898**, pp. 333, 334, 338, 1900; Smith, Proc. Biol. Soc. Wash., **49**, pp. 89, 91, 1936.

Sceloporus fulvus Bocourt, Miss. Sci. Mex., Zool., **3**, sec. 1, pp. 214–215, pl. 18bis, figs. 8, 8 *a*, 8 *b*, 8 *c*, 1874—La Union, Salvador; Boulenger, Cat. Liz. Brit. Mus., **2**, pp. 218, 238, 1885; Günther, Biol. Cent.-Amer., Rept. Batr., p. 76, 1890; McLain, Contrib. Neotrop. Herp., p. 2, 1899; Schmidt, Field Mus. Nat. Hist., Zool. Ser., **12**, pp. 193, 196, 1928.

Type locality.—Guatemala and the Volcán Antigua, Guatemala.

Distribution.—Eastern Chiapas, along the Pacific slopes of Central America to Costa Rica (fig. 52).

Diagnosis.—A small *Sceloporus*, maximum snout-vent measurement 57 mm.; dorsal scales 28 to 37, average 31.9; ventral scales 33 to 47, average 38.1; scales around body 29 to 46, average 36.5; femoral pores three to six, average 4.4; head scales rugose; anterior and posterior sections of frontal longitudinally divided; frontoparietals single on each side, small, broadly in contact medially; one row of lorilabials; canthal single; two postrostrals; tail slender,

FIG. 52. Distribution of *Sceloporus squamosus*, △.

approximately twice body length; no postfemoral dermal pocket; ventral scales very weakly keeled, pointed; preanal scales strongly keeled in females; postanals poorly developed, or absent.

Description.—Dorsal head shields strongly rugose; interparietal more or less triangular in shape, about four times as large as either parietal; latter wedge-shaped, one on each side; three pairs of scales in the frontal region, the posterior pair the frontoparietals, the others composing the frontal, divided into four scales; supraoculars large, four to six, usually five, separated from median head scales by a usually complete row of small scales; superciliaries five or six, usually

six, separated from supraoculars by one complete and another incomplete row of small scales; prefrontals usually separated by an azygous scale; frontonasals irregular, the median usually separated from the lateral frontonasals; internasals irregular; nasal separated from rostral; postrostrals two; one canthal; subnasal large; preocular divided; usually a single loreal on each side; one row of lorilabials, the scales imbricating anteriorly; usually three postoculars; supralabials imbricating anteriorly; infralabials imbricating posteriorly; about three and one-half supralabials and three or four infralabials to a point below middle of eye.

Mental pentagonal, with a labial border about one-half that of rostral; about four postmentals on each side, the anterior scale of either side in contact with its fellow, others separated medially; outer row of labiomentals terminating anteriorly wedged between first postmental and first infralabial; gular scales smooth or very weakly keeled, pointed; lateral gular scales reduced in size, very small below ear.

Auricular lobules very small, much smaller than preceding scales; temporal scales keeled, not mucronate, subequal in size to scales between ear and lateral nuchal pocket; latter scales more strongly keeled, mucronate; lateral nuchal pocket very deep, with a relatively small, inconspicuous opening; scales between pocket and arm somewhat smaller than scales preceding pocket.

Dorsal scales rather strongly keeled, mucronate, not denticulate, in parallel rows; about eight rows of dorsals at nape, seven at rump; lateral scales not so strongly keeled and mucronate as dorsals, about two-thirds size of dorsals, in oblique rows tending toward the parallel; ventral scales smooth or very weakly keeled, pointed, about one-half size of dorsal scales.

Dorsal scales of foreleg keeled, mucronate, those on upper foreleg more strongly keeled and slightly larger than those on lower foreleg, about three-fifths size of dorsal scales on body; all scales of lower foreleg keeled, the median ventral scales somewhat smaller than dorsals of same member; ventral scales of upper foreleg weakly keeled, the largest about two-thirds size of ventral scales of lower foreleg; lamellar formula for fingers 6–10–16–14–9 (6–11–14–15–8).

Dorsal scales of hind leg keeled, weakly mucronate; those on thigh slightly smaller than dorsal scales on body, slightly larger than dorsals of shank; scales on anterior and ventral surfaces of thigh weakly keeled, pointed, becoming smaller toward femoral pore series; scales on posterior surfaces of thigh small, imbricating,

smooth; scales on ventral surfaces of shank keeled, pointed, somewhat smaller than dorsal scales of same member; lamellar formula for toes 8–11–16–21–? (8–11–16–21–12).

Dorsal caudal scales somewhat larger than dorsal scales on body, strongly keeled, strongly mucronate; subcaudal scales keeled, mucronate; preanal scales strongly keeled in females; postanal scales absent in males, or poorly developed.

Color.—General dorsal coloration of males very dark reddish-brown, or seal brown, lighter on the head; a white lateral line present, originating anteriorly at a point above and between ear and lateral nuchal pocket and continuing posteriorly onto tail; this stripe covers the inner half of the outer row of dorsals, and the outer half of the adjacent row of dorsals; lateral light line becoming reddish-brown posteriorly at groin or base of tail; a light line from rostral through middle of ear to foreleg; a light line from dorsal margin of insertion of foreleg to or nearly to the lateral light line, this bordered posteriorly by a black spot; between the dorsolateral light lines a series of nine oblique dark spots on each side, usually distinct, their posterior borders light-edged; the series usually separated, occasionally united; when united, only the lateral posterior borders light-edged; occasionally a more or less zigzag pattern evident, due to alternation and coalescence of the tips of the dark red spots; the sides of the body are irregularly flecked with white, the flecks sometimes arranged in indistinct vertical or oblique rows; ventral surfaces dirty white, tinged with gray laterally on the abdomen.

Females with a general dorsal coloration much like that of the males, except that the dorsolateral light lines are very broad posteriorly, one and one-half scales wide, and very strongly tinged with reddish posteriorly; a more or less distinct broken light line of varying width passes from near the axilla to the groin; ventral surfaces as in the males.

Two very young specimens (19 mm. snout to vent) show a juvenile coloration somewhat different from the adult. The back is uniform light clay color, with very small, dark spots arranged in two dorsolateral rows. The dorsolateral light lines are absent. The sides are dark brown, darker toward the dorsum, sharply defined from light dorsal coloration.

Variation.—The variation in scutellation of the head in 60 specimens follows: parietals two on one side in one, both sides in one; frontoparietals two on one side in four specimens; frontoparietals in contact medially in all; occasionally frontal and frontoparietals

fused in various manners; supraoculars four to six (4, twenty-one; 5, ninety-seven; 6, two); prefrontals in contact medially in one; an azygous scale between prefrontals in all; median frontonasal in contact with both lateral scales in 25, with one lateral scale in 9, with neither lateral scale in 24, irregular in 2; one canthal in all; four postrostrals in one; preocular divided in all; loreals none to two (0, three; 1, eighty-three; 2, thirty-four) (in the cases in which loreal is absent, it has been fused with preocular).

Dorsal scales 28 to 37 (67 specimens: 28, one; 29, five; 30, eleven; 31, fourteen; 32, eleven; 33, eleven; 34, nine; 35, three; 36, one; 37, one); ventral scales 33 to 47 (45 specimens: 33, one; 34, two; 35, four; 36, five; 37, eight; 38, four; 39, eleven; 40, three; 41, three; 42, one; 43, two; 47, one); scales around body 29 to 46 (52 specimens: 29, one; 31, one; 33, one; 34, three; 35, thirteen; 36, nine; 37, ten; 38, four; 39, four; 40, four; 41, one; 46, one); femoral pores three to six (122 counts: 3, seven; 4, sixty-five; 5, forty-one; 6, nine). Females tend to have a lower number of femoral pores, as may be observed by the following table.

Pores	Females	Males
3	5	2
4	32	27
5	8	27
6	3	4

There is some geographical significance in the variation of dorsal scale count and number of femoral pores. In eight Chiapas specimens the lowest femoral pore count is four, and this occurs but three times (sixteen counts). In six Guatemala specimens, the count of three does not occur, but the count of four occurs seven times (12 counts). In ten counts on specimens from Salvador, four, the lowest count, occurs once. Specimens from Nicaragua extend the range of the femoral pore count to three, and the count of six does not occur.

The maximum dorsal scale count of Chiapas specimens is 31 (minimum, 28) and the average is 29.4, or, in round numbers, three scales below the average of the entire series. The lowest count in the other specimens is 29 (occurring once).

Remarks.—I have been unable to separate two forms from this complex, as did Bocourt, who recognized *fulvus* and *squamosus*. The differences noted by this author concern the character of ventral scales (smooth or keeled), character of postanal plates in males, and coloration. I believe the confusion with regard to ventral scales is due to the sexual dimorphism, in which females present strongly

keeled preanal scales, and males nearly smooth preanals. The postanal plates vary in specimens from a single locality, some having fairly distinct plates, others lacking them completely. The coloration difference proposed by Bocourt may also be attributed to sexual dimorphism.

An *Oxybelis acuminatus* (FMNH 10998) from Divisadero, Department of Morazon, El Salvador, contained in its stomach one specimen of *S. squamosus*.

Locality records.—Chiapas: Tapachula (EHT 7611–9); Huehuetan (USNM 47759).

Guatemala: Retalhuleu (USNM 35676); vicinity of Guatemala City (USNM 25218, 25221); Volcán La Antigua (Bocourt, 1874); Hacienda California (MCZ 1); Progreso, Jalapa (CAS 68357, 68376); Volcán Agua (CAS 68346–56); El Rancho (FMNH 20568 [3]).

Honduras: Copán (UMMZ 1).

Salvador: La Union (Bocourt, 1874); Acajutla (LSJU 3525, 3529); San Jose del Sacaré, Chalatenango (FMNH 10967–9); Divisadero, Morazan (FMNH 10975); Gigante Mine, near Divisadero (FMNH 10984–5).

Nicaragua: (USNM 7322; 1 specimen in 26, others *v. olloporus*); Polvón (UMMZ 71762 [4]; CAS 54641; MCZ 3808 [12], 4651 [11]); Chinandega (MCZ 9594, 9526–39; UMMZ 46443 [4]).

Costa Rica: Salinas (ERD 1).

THE UTIFORMIS GROUP[1]

Sceloporus utiformis Cope is referred to a distinct section of the genus. The characteristics of this species which appear to warrant its separation from other groups of *Sceloporus* are: large, heavily keeled dorsal scales; granular lateral scales; granular scales on posterior surface of thigh; absence of a postfemoral dermal pocket; preanal scales weakly keeled in females; males without distinctive lateral markings on belly; tail very long; tendency toward a division of posterior section of frontal; head scales rugose; males with slightly enlarged postanals; absence of rudimentary gular fold.

S. utiformis has in common with the *siniferus* group: keeled preanal scales in females; divided posterior section of frontal; small scales on posterior surface of thigh; rugose head scales; immaculate belly in male. It seems evident that *utiformis* is directly allied to the *siniferus* group, within which the species *Sceloporus siniferus*

[1] Approximately 231 specimens examined.

approaches it most closely. This is shown by the small lateral scales, in males, very long tail, similar habitus, and relatively large size of *siniferus*.

Sceloporus merriami, which I formerly placed in the *utiformis* group (on the basis of granular lateral scales), differs from *utiformis* in a number of characters which link it definitely with the *variabilis* group (see discussion under the *merriami* group).

Sceloporus utiformis Cope.

Sceloporus utiformis Cope, Proc. Acad. Nat. Sci. Phila., **1864**, p. 177, 1864; Sumichrast, Bibl. Univ. Rev. Suisse, **46**, p. 243, 1873; Bocourt, Miss. Sci. Mex., Zool., **3**, sec. 1, pp. 208–210, pl. 18bis, figs. 6, 6 *a*, 6 *b*, 1874; Yarrow, Bull. U. S. Nat. Mus., **24**, pp. 62, 189, 1883; idem, Smithson. Misc. Collec., **517**, p. 10, 1883; Garman, Bull. Essex Inst., **16**, p. 18, 1884; Boulenger, Cat. Liz. Brit. Mus., **2**, pp. 238–239, 1885; Cope, Proc. Amer. Phil. Soc., **22**, pp. 394, 396, 1885; idem, Bull. U. S. Nat. Mus., **32**, p. 35, 1887; Günther, Biol. Cent.-Amer. Rept. Batr., pp. 76–77, 1890; Herrera, Cat. Rept. Mus. Nac., Mex., p. 18, 1895; Dugès, Naturaleza, (2), **2**, p. 479, 1896; Van Denburgh, Proc. Acad. Nat. Sci. Phila., **1897**, p. 461, 1898; Boulenger, Proc. Zool. Soc. Lond., 1897, pp. 521–522, 1897; idem, **1898**, p. 915, 1898; Mocquard, Bull. Soc. Philom. Paris, (9), **1**, p. 156, 1899; Cope, Ann. Rept. U. S. Nat. Mus., **1898**, pp. 334, 338, 1900; Herrera, Cat. Rept. Mus. Nac., Mex., 2nd ed., p. 18, 1904; Dickerson, Bull. Amer. Mus. Nat. Hist., **41**, pp. 468–469, 1919; Smith, Trans. Kans. Acad. Sci., **37**, pp. 265, 267, 1934; Burt, Trans. Amer. Micr. Soc., **54**, pp. 173–174, 1935; Taylor, Univ. Kans. Sci. Bull., **24**, pp. 519–520, 1938.

(?)*Sceloporus cupreus* Gadow, Jorullo, pp. 55, 65, 1930—Jorullo, Michoacán.

Type locality.—Colima, Mexico. Cotypes USNM 42089 ("Colima," John Xantus, 1863) and 42090 ("Near Cachan River, Michoacán," John Xantus, May, 1863).

Distribution.—Pacific slope of Mexico from southern Sinaloa to western Guerrero, inland about 125 miles in the southern part of its range (fig 53).

Diagnosis.—Dorsal head scales rugose; anterior section of frontal two or three times as large as posterior section, frequently entire; posterior section of frontal usually longitudinally divided; dorsal scales 39 to 51 from occiput to base of tail, mucronate, strongly keeled, in ten to twelve longitudinal rows in middle of back, seven at nape and at rump; scales on sides of neck granular; scales on sides of body very small, keeled; lateral ventral scales keeled; median ventral scales smooth; posterior preanal scales keeled, mucronate in females, smooth in males; femoral pores thirteen to nineteen on each side; scales on posterior surface of thigh granular; no postfemoral dermal pocket; enlarged preanals present in males; tail more than twice

length of body. General ground color brown; black or dark brown crossbars on back; males without lateral abdominal marks; tail strongly banded.

Description.—Dorsal head scales rugose; interparietal subtriangular, about four times as large as anterior section of parietal; parietal divided, the posterior section entire or divided into several sections; frontoparietals single on each side, more or less square in

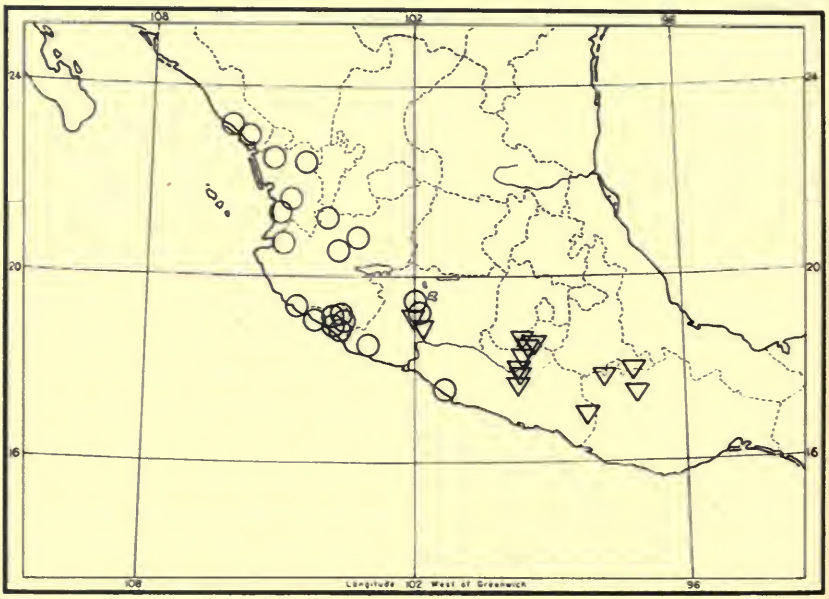

FIG. 53. Distribution of *Sceloporus utiformis*, ○; and *S. gadoviae*, ▽.

shape, occasionally in contact medially, frequently separated medially by an azygous scale; frontal often in contact with interparietal; posterior section of frontal one-half or one-third size of anterior section, usually longitudinally divided; anterior section of frontal frequently entire; supraoculars in one or two rows; outer row of supraoculars rarely absent, usually incomplete, occasionally reduced to one scale; supraoculars always separated from median head scales by one row of small scales, and separated from superciliaries by one or two incomplete rows of small scales; superciliaries seven, all usually visible from above; prefrontals frequently separated by an azygous scale; frontonasals normal, subequal in size; scales in internasal region irregular; nasal small; four small, rounded or square scales behind rostral; rostral never in contact with nasal; two can-

thals; subnasal always present; usually three loreals; preocular always divided; one complete and another incomplete row of lorilabials; subocular large, strongly keeled, usually separated from supralabials by one row of scales, rarely by two; two postoculars, strongly keeled; lorilabials keeled; three and one-half supralabials and four infralabials to a point below middle of eye; infralabials imbricating posteriorly.

Mental pentagonal, with a labial border about one-half that of rostral; about five postmentals in a row on each side behind mental, the first scales in contact medially, the remainder separated medially; lateral gular scales very weakly keeled; all except anterior gular scales pointed; median posterior gular scales smaller than adjacent scales; outer row of labiomentals terminating anteriorly between posterior part of first postmental and first infralabial; inner row of labiomentals terminating anteriorly below third infralabial; gular scales extending to lower edge of ear, but reduced in size.

Auricular lobules very small, usually smaller than preceding scales; temporal scales keeled, not mucronate or pointed, dorsal temporal scales more strongly keeled; all lateral nuchal scales granular, except those surmounting various skin folds; lateral nuchal pocket present; a series of enlarged scales extending from middle of nuchal pocket to a point below ear; scales in a small area below this series somewhat larger than scales above; a small, elongate group of slightly enlarged scales on lower part of lateral nuchal fold; three rows of somewhat enlarged scales passing dorsally from nuchal pocket, one terminating at upper edge of ear, the others disappearing on side of neck, the middle series passing vertically upward, the posterior series passing diagonally upward and backward; a short longitudinal series of much enlarged scales above nuchal pocket, near dorsal series of enlarged scales.

Dorsal scales large, mucronate, strongly keeled, 39 to 51 from occiput to base of tail, in seven rows at nape and rump, 10 to 12 at middle of body; dorsal scale rows generally parallel, a few rows arising on sides of body and converging toward the middle posteriorly; lateral scales very small, keeled, larger at middle of body than toward fore or hind legs; lateral ventral scales keeled, pointed, much larger than lateral scales, about one-half size of dorsal scales, becoming somewhat smaller toward middle of belly; ventral scale rows strongly divergent; all ventral abdominal scales pointed; preanal scales smaller than preceding scales; posterior preanal scales smooth in males, keeled and more strongly pointed in females.

Dorsal scales of foreleg keeled, mucronate, those on upper foreleg somewhat smaller than ventral scales of body, somewhat larger than dorsal scales of lower foreleg; scales at elbow reduced in size; ventral scales of lower foreleg one-half to two-thirds size of dorsals of same member, keeled; two series of scales on anterior surface of lower foreleg smooth; ventral scales of upper foreleg very small near axilla and elbow, larger and keeled on the middle of the joint; lamellar formula for fingers 8–12–17–16–10 (8–13–17–17–11).

Dorsal scales of hind leg keeled, but not so strongly as dorsal body scales; dorsal scales of shank not strongly mucronate, subequal in size to or slightly smaller than dorsal body scales; dorsal scales of thigh strongly mucronate, somewhat smaller than dorsal scales of shank; scales on anterior and ventral surfaces of thigh smooth, pointed, smaller toward series of femoral pores; ventral thigh scales near medial end of femoral pore series sometimes weakly keeled in females; scales on posterior surface of thigh granular, very slightly enlarged near series of femoral pores; femoral pores 13 to 19 on each side; scales on posteroventral and concealed surfaces of shank smooth, pointed, about two-thirds size of dorsal scales of same member; lamellar formula for toes 8–14–19–24–15 (9–14–20–24–16); ventral scales of thigh separated from preanal scales by an indistinct fold covered by scales much smaller than adjacent scales.

Dorsal caudal scales strongly keeled, strongly mucronate, somewhat larger than dorsals on body; subcaudal scales keeled, pointed or mucronate; enlarged postanals present in males; no postfemoral dermal pocket.

Coloration.—General dorsal ground color brown, darker in males than in females; a series of about seven crossbars on back, black in females or dark brown in males, usually broken medially and edged posteriorly by white, the anterior edges more or less indefinite; in males these crossbars are frequently obsolete; some of the crossbars near the middle of the body extend onto the sides in females; a more or less distinct dorsolateral light line extending from neck to base of tail is present in females; it is frequently very indistinct posterior to a point above axilla, absent or very indistinct in males; females frequently with a broken white lateral line from axilla to hind leg; both sexes with a broken white band on posterior surface of thigh, passing onto sides of base of tail; the dorsal surfaces of body, base of tail, and limbs are flecked with white in males; limbs with broad dark brown bands; tail with dark bands separated by lighter intervals about one and one-half times as broad as the dark bands; tail bands,

except those near base of tail, usually passing entirely around tail in males, usually not in females.

Gular region dusky, with narrow oblique light lines; upper labial region frequently with light vertical lines, more distinct in males; usually a broad dark light-bordered band passing from lower edge of eye to lower labial region (narrow in females); sides of belly dusky occasionally, sometimes faintly barred.

Young specimens of both sexes have dorsolateral light lines, and the dark markings are less distinct.

Variation.—In 40 specimens, the following variation in head scales was noted: parietal small, either divided into two scales subequal in size, or the posterior section broken into several small scales; frontoparietals in contact medially in 12, separated in nine; azygous scale separating frontal and interparietal in 13; frontal in contact with interparietal in 15; frontal entire in one; posterior section of frontal divided longitudinally in 36; anterior section divided in seven, usually twice or three times as large as posterior; prefrontals separated by an azygous scale in 30, by contact of median frontonasal and frontal in one, and in contact medially in nine; lorilabials in two complete rows below subocular in three specimens, frequently but two or three scales of the incomplete series of lorilabials present in the loreal region; second pair of postmentals in contact in one specimen.

Habits and habitat.—Stomach contents of a few specimens examined consisted, in the order of abundance, of ants, beetles, termite workers, bugs, and Orthoptera.

No observations concerning the habits and habitats of this species have been published. The range in elevation is considerable, from Manzanillo, practically at sea level, to Uruapán, at an elevation of 5,249 feet. At Uruapán, it is rather common on stumps in an oak region; at Hacienda El Sabino, about 20 miles to the south and about 1,000 feet lower, the species is very rare, and is found in dense brush on logs or limbs of shrubs. At Hacienda Paso del Rio in Colima it was found in shady, wooded areas on hills.

Females collected July 26 at Hacienda Paso del Rio contain small eggs about 6 mm. in diameter. Specimens collected June 19 and 20 at Queseria, Colima, have no eggs in the oviducts, but have several well-developed eggs in the ovaries. It is not known that the species is ovoviviparous, but it appears to be from these data. No very young specimens have been examined.

Locality records.—Sinaloa: 15 mi. S of Presidio (near Mazatlán) (EHT 7208); Rosario (USNM 47687–8, 47692). Nayarit: Cerro de San Juan, near Tepic (EHT 7209–21); Minaman (Miramar?) (MCZ 27085); Tepic (Boulenger, 1898); Rosamorada (AMNH 15527); Sierra del Nayarit (Mocquard, 1899); N of Santiago Ixcuintla (AMNH 19053). Jalisco: near Cinco Minas (N of Magdalena) (EHT 7292–6); Tenacatita Bay (LMK 7327–31); Tenacatita (LMK 10141, 10152); Barranca Ibarra (USNM 18978, 18980); San Sebastian (USNM 64657); Vallarta (Las Peñas) (AMNH 15677–83, 15687). Colima: Queseria (EHT 7237–78; UMMZ 80081, 80082 [4], 80083 [6]); Hda. Paso del Rio (EHT 7297–7332; UMMZ 80091 [4], 80092 [6]); near Manzanillo (EHT 7279–91; LAM 3; FMNH 1660a; AMNH 15655, 15684–6); near Villa Juarez (UMMZ 80084–6, 80090); Hda. Gloria, 8 km. SW of Tecoman (UMMZ 80087 [2], 80088 [2]); 1 mi. E of Pascuales (UMMZ 80089); Rio Salado, SE of Hda. Las Ortices (UMMZ 80093 [2]); Armeria (FMNH 1660); Volcan Colima (FMNH 1659); near Colima (AMNH 15656–7, 15476, 12765, 15659–76); 8 mi. W of Colima (AMNH 12763); La Fundición (AMNH 12755–6); 8 mi. N of Periquillo (AMNH 12752); Arroyo de La Estancia (AMNH 12745); E of San Cayetano (AMNH 15531); Tecoman (AMNH 12747, 12749, 15688–97, 15699–712). Michoacán: near Cachan River (USNM 42090); Hda. El Sabino (EHT 7237, 7333); Uruapán (EHT 7222A, 7222–7236). Guerrero: Petatlan Bay (LMK 7349).

THE SCALARIS GROUP[1]

Seven forms are recognized as the *scalaris* group: *jalapae, scalaris scalaris, scalaris slevini, scalaris unicanthalis, goldmani, aeneus aeneus,* and *aeneus bicanthalis.* These forms have the following characters in common: general tendency of lateral scale rows to be parallel (oblique in *jalapae* and *goldmani,* presumably primitive species, and slightly oblique in *s. slevini*); femoral pore series nearly meeting or in contact medially; granular scales on posterior surface of thigh; absence of postfemoral dermal pocket; two postrostrals, or none;—tendency of head scales to be rugose or keeled (least rugose in *jalapae*); frontal with a single, transverse division; preanal and ventral scales smooth in both sexes; enlarged postanals present in males; males with distinctive ventral coloration; small or moderate size (maximum snout-vent measurement 78 mm.); moderate size of dorsal scales, with a relatively small range in variation (35 to 62 from occiput to base of

[1] Approximately 538 specimens of this group have been examined.

tail). The only species doubtfully included in this group is *jalapae*, which differs from the remaining forms in having the lateral scales in distinctly oblique rows, and in lacking postrostrals. However, considering that diagonal lateral scale rows are apparently primitive, that those of *jalapae* are not so strongly diagonal as in most other species of *Sceloporus*, and that diagonal scale rows occur elsewhere

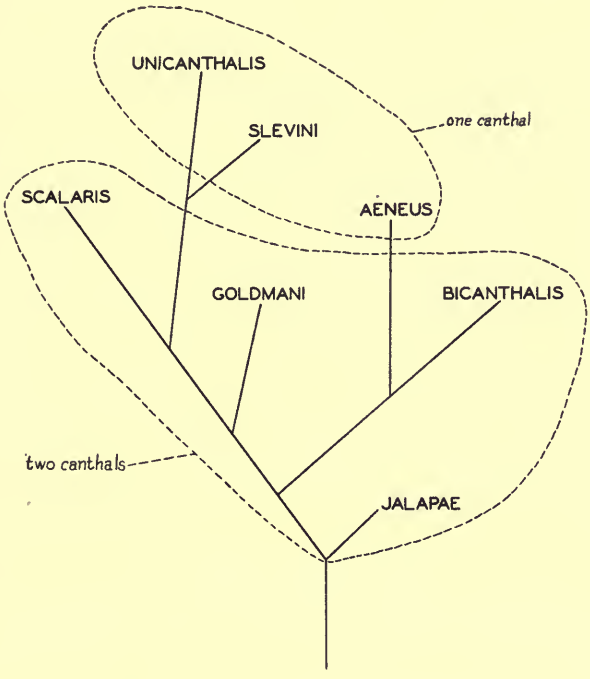

FIG. 54. Phylogeny of the *scalaris* group.

in the group, the association of *jalapae* with the *scalaris* group is less surprising.

S. jalapae is clearly the most primitive member of the group. *S. scalaris, aeneus,* and *goldmani* are more closely related to each other than any one of these is to *jalapae*, as shown in the character of the lateral scales, stronger carination of head scales, two postrostrals, and presence (in the primitive subspecies of each species) of dark bars in the gular region. These relationships are shown in the accompanying diagram.

The geographical distribution of these species and subspecies corresponds rather closely to the phylogenetic scheme. The group

on the whole has a V-shaped distributional area; *S. goldmani* is exceptional, occupying a north central position. *S. jalapae* occurs at the extreme southern tip of this area. *S. scalaris* is typically western in distribution, and *aeneus* is typically eastern. *S. aeneus bicanthalis* is the more primitive of the two subspecies of *aeneus*, and occurs farthest to the south, while the more recently developed subspecies *aeneus aeneus* occupies the west central part of the range of its species. *S. scalaris scalaris* is the most primitive of the three forms of *scalaris*, and occurs farthest to the south. It is noteworthy that the more primitive forms of the group (*jalapae, goldmani, scalaris scalaris*, and *aeneus bicanthalis*) have two canthals, while the others have one.

The life histories of the species are poorly known, despite the fact that some of them are common. Some of the species are certainly ovoviviparous, while others appear to be oviparous. All occur at high elevations, reaching 14,000 feet. In Mexico they do not usually occur below 5,000 feet; so far as I am aware, they consistently occur above this elevation in the United States.

The areas of intergradation of the subspecies of the group have not been defined; the ranges and variation of *goldmani* and *scalaris unicanthalis* are imperfectly known, and it is not evident from the material available what subspecies of *scalaris*, if any, occurs in the Sierra Madre between Nayarit and Chihuahua.

KEY TO THE SPECIES AND SUBSPECIES OF THE SCALARIS GROUP

1.—Nasals and internasals in contact with rostral; no postrostrals. . *jalapae* (p. 333)
Nasals and internasals separated from rostral by two postrostrals. 2

2.—Dorsal scales 50 or more; lateral scales in slightly, although distinctly, oblique rows. . . . . *goldmani* (p. 350)
Dorsal scales less than 50; lateral scales in parallel rows. 3

3.—One canthal. 4
Two canthals, the first occasionally forced above canthal ridge by contact of second canthal and subnasal. 6

4.—Males with much black in ventral coloration; females suffused with black below; gular region never barred; black shoulder spot with a light blue spot, if present, on its anterior edge; tail with a continuous dark median dorsal stripe; tibia/head proportion usually less than 0.95; maximum snout-vent measurement 58 mm. . . . . *aeneus aeneus* (p. 353)
Black, if present on ventral surface, confined to bars in gular region, and a few dark, transverse bars on sides of abdomen; black shoulder spot with the light blue spot in its middle. 5

5.—Tibia/head proportion usually less than 0.90; scales of second pair of postmentals separated medially; dorsal scales usually more than 40; maximum snout-vent measurement 61 mm. . . . . *scalaris slevini* (p. 343)
Tibia/head proportion usually more than 0.90; scales of second pair of postmentals usually in contact medially; dorsal scales usually less than 40; maximum snout-vent measurement 65 mm. . . *scalaris unicanthalis* (p. 349)

6.—Males with much black in ventral coloration; black shoulder spot with the light blue spot, if present, on its anterior edge; tail with a continuous dark median dorsal stripe; tibia/head proportion usually less than 0.90; maximum snout-vent measurement 56 mm. . . . . *aeneus bicanthalis* (p. 356)

Black, if present on the ventral surface, confined to bars in gular region, and a few dark transverse bars on sides of abdomen; black shoulder spot with the light blue spot in its middle; tail with dark chevron-shaped bars; tibia/head proportion usually more than 0.90; maximum snout-vent measurement 78 mm. . . . . *scalaris scalaris* (p. 338)

Sceloporus jalapae Günther.

Sceloporus graciosus Cope, Proc. Amer. Phil. Soc., **22**, p. 379, 1885; idem, Ann. Rept. U. S. Nat. Mus., **1898**, pp. 286–289, 1900 (part).

Sceloporus gratiosus Boulenger, Cat. Liz. Brit. Mus., **2**, pp. 230–231, 1885 (part); Günther, Biol. Cent.-Amer., Rept. Batr., p. 71, 1890 (part); Boulenger, Proc. Zool. Soc. Lond., **1897**, pp. 507–508, 1897 (part).

Sceloporus jalapae Günther, Biol. Cent.-Amer., Rept. Batr., p. 74, 1890; Boulenger, Proc. Zool. Soc. Lond., **1890**, p. 78, 1890; Smith, Proc. Biol. Soc. Wash., **47**, pp. 121–125, 1934; idem, Trans. Kans. Acad. Sci., **37**, p. 272, 1934; idem, Proc. Biol. Soc. Wash., **49**, p. 89, 1936; idem, Occ. Papers Mus. Zool. Univ. Mich., **361**, p. 2, 1937.

Sceloporus scalaris Gadow, Proc. Zool. Soc. Lond., **2**, p. 214, 1905—Sierra de San Felipe, Oaxaca.

Type locality.—Jalapa, Vera Cruz, Mexico. Type in British Museum, collected by C. T. Hoege.

Distribution.—Central Vera Cruz south through eastern Puebla to central Oaxaca (fig. 56).

Diagnosis.—A small *Sceloporus*, maximum snout-vent measurement 51 mm.; head shields weakly striated or keeled, or nearly smooth; usually two canthals; no postrostrals; dorsal scales 50 to 62, average 55.6; dorsals much larger than ventrals, in longitudinal rows slightly divergent posteriorly; scales around body 50 to 66, average 56.8; ventral scales 53 to 66, average 57.4; ventrals smooth; length of fourth toe approximately equal to distance from snout to lateral nuchal pocket; median auricular lobule usually greatly enlarged, extending across ear; femoral pores 17 to 21, average 19.2; none to three scales separating femoral pore series; no postfemoral dermal pocket; scales on posterior surface of thigh very small or granular.

Description.—Scales of prefrontal and anterior supraorbital region sometimes weakly striated or keeled, the remainder smooth or slightly rugose; interparietal rounded, three-fourths to four-fifths size of interorbital area; parietals one or two on each side, frequently in contact medially, rarely separated by an azygous scale; frontal typical, occasionally in contact with interparietal; supraoculars four or five, large, separated from median head scales by a complete row

of small scales, from superciliaries by one complete and one or two incomplete rows of small scales; superciliaries six on each side (rarely five); prefrontals frequently in contact medially, occasionally separated by contact of median frontonasal and frontal or by an azygous scale; frontonasals usually typical, the median occasionally separated from lateral frontonasals, or divided into several scales; two pairs of internasals, the anterior pair always in contact with

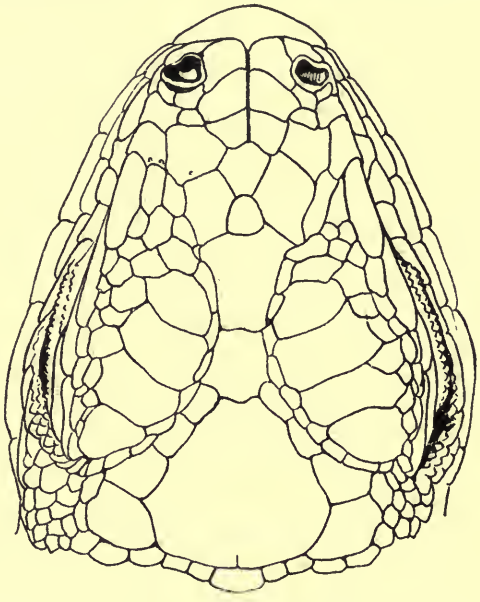

FIG. 55. Head scales of *Sceloporus jalapae*.

rostral; nasal large, broader anteriorly than posteriorly, in contact with rostral; no postrostrals; subnasal usually present; two canthals, the first frequently in contact with lorilabials; loreals usually one on each side, occasionally two; preocular rarely divided; subocular separated from supralabials by a single row of lorilabials; two postoculars; an incomplete row of lorilabials present on sides of head; four supralabials, five infralabials to a point below middle of eye.

Mental pentagonal, with a labial border about two-thirds that of rostral; about five postmentals, the anterior scale of either series in contact medially with its fellow; gular scales smooth, entire, lateral scales slightly larger than median scales.

Auricular lobules variable in number, one to five; a single, large auricular lobule always present, sometimes extending across tym-

panum; temporal scales keeled, mucronate, the median scales smaller than surrounding scales; scales between ear and nuchal fold keeled, strongly mucronate, larger than scales in temporal region; a weak fold from posterior edge of nuchal pocket to a point above arm, surmounted by scales smaller than those above or below it (sometimes the fold may be a short distance from the longitudinal area of small scales); scales above arm very small.

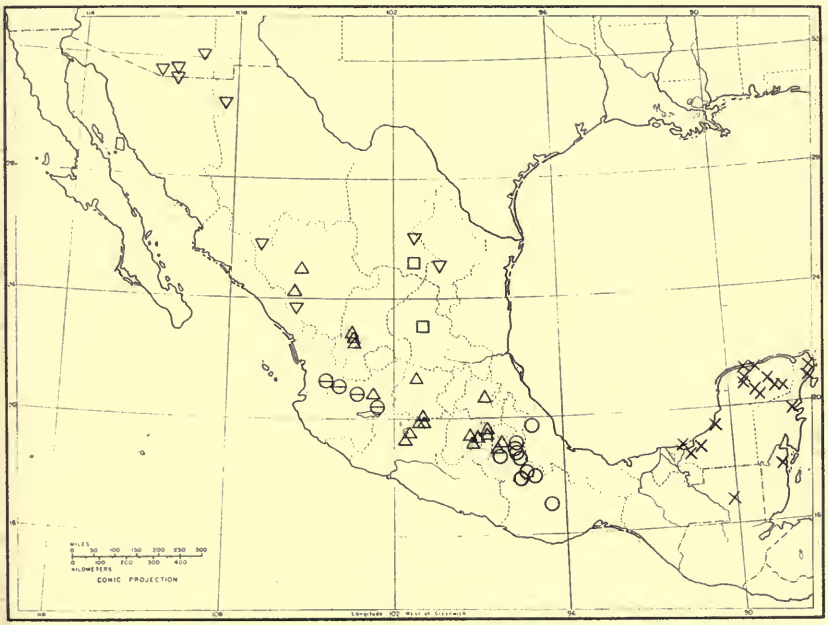

FIG. 56. Distribution of *Sceloporus jalapae*, ○; *S. goldmani*, □; *S. scalaris scalaris*, △; *S. s. slevini*, ▽; *S. s. unicanthalis*, ⊖; and *S. chrysostictus*, ×.

Dorsal scales keeled, mucronate, not denticulate, ten to fourteen equaling snout-occiput length; dorsal scale rows divergent on fore part of back, parallel posteriorly; about 14 rows of dorsals at nape, 11 at rump; lateral scales keeled, mucronate, not denticulate, smaller than dorsals, larger than ventrals, in oblique rows directed upward; ventral scales smooth, those near posterior part of abdomen sometimes weakly keeled; preanal scales slightly smaller than ventral abdominal scales.

Dorsal scales of foreleg keeled, mucronate, those of upper foreleg slightly smaller than dorsal scales on body, slightly larger than scales on lower foreleg; median ventral scales of lower foreleg about

one-half the size of dorsal scales of same member, keeled, mucronate; scales on anterior surface of lower foreleg smooth; ventral scales of upper foreleg smaller than median ventral scales of lower foreleg; lamellar formula for fingers 8–12–17–16–10.

Largest dorsal scales of hind leg subequal in size to dorsal scales on back, keeled, mucronate, sometimes weakly denticulate; scales on anterior and ventral surfaces of thigh smooth, rounded, decreasing in size toward femoral pore series; scales on posterior surface of thigh very small, smooth; ventral scales of shank smooth, somewhat smaller than dorsal scales of same member; scales at ankle very small; lamellar formula for toes 7–12–17–22–14.

Dorsal caudal scales keeled, mucronate, somewhat larger than dorsal scales on body; subcaudals smooth, entire at base of tail, becoming keeled and mucronate toward tip of tail; basal caudal and preanal scales smooth in females, as in males; enlarged postanals present and well developed in males; no postfemoral dermal pocket.

Coloration.—Head in males light blue above and on sides; a broad lateral dark band beginning above tympanum and extending above foreleg to upper groin; an indistinct white line bordering the lateral dark band below axilla and groin; a black spot on shoulder, with a short narrow extension onto the upper arm; a bright white line beginning at upper edge of tympanum, bordering the lateral dark band below, separating it from the black spot on shoulder, terminating above the anterior border of the insertion of the foreleg; a black spot on shoulder connected with lateral black band above insertion of foreleg; a broad, light blue band bordering the dark band above; a broad light blue median dorsal band, slightly darker than the lateral light blue bands bordering it; about 12 rounded black spots situated on the sides of the median dorsal band, in a series beginning above the lateral cervical folds and terminating at the base of the tail, each spot connected with the lateral dark band by a narrow black line, curved anteriorly.

Sides of abdomen, between fore and hind legs, blue, darker on the median ventral border; ventral surfaces of limbs, breast, tail, and a median ventral abdominal line three to eight scales wide, whitish; anterior part of gular region closely stippled with light blue and black; dorsal surfaces of limbs grayish blue; posterior surfaces of femora with a few distinctly outlined, white spots.

General ground color in females brownish; a lighter band beginning at posterior border of orbit, passing to base of tail. Crossing this light band, and extending medially a short distance, but sepa-

rated from the series on the opposite side by several scale rows, is a series of 12 or 13 narrow undulate dark brown crossbars, sometimes bordered behind by lighter brown; the limbs are very dark, banded with alternate light and dark brown; the ventral surfaces of the limbs and abdomen are whitish and sometimes, on abdomen, with a light bluish suffusion; the anterior part of the gular region is faintly marked with light blue. There is no black spot to be seen on the shoulder.

Variation.—The variation in cephalic scutellation in 19 specimens is as follows: parietals one or two, one occurring on both sides in one specimen; frontoparietals one to three (1, five; 2, twenty-five; 3, four); frontal touches interparietal in six; frontoparietals contact medially in nine, separated by an azygous scale in two; frontal entire in one; superciliaries usually six, five on one side in one; supraoculars four to five (4, twenty; 5, twelve); prefrontals contact medially in eight, are separated medially by an azygous scale in five, by contact of frontal and median frontonasal in seven; median frontonasal irregular in one, separated from lateral frontonasals on one side in two; subnasal absent in three; first canthal touches lorilabials on one side in two, on both sides in 13; preocular divided on one side in one; loreals one or two (1, thirty-one; 2, five); subocular separated from supralabials by two complete rows of scales in one specimen, on one side.

Dorsal scales 50 to 62 (50, one; 51, two; 52, two; 53, two; 54, one; 55, one; 56, one; 57, one; 58, two; 59, three; 61, one; 62, one); ventral scales 53 to 66 (53, one; 54, one; 55, one; 56, two; 57, three; 58, four; 60, one; 62, one; 66, one); scales around body 50 to 66 (50, one; 52, one; 53, one; 54, three; 55, one; 56, two; 57, one; 58, three; 59, two; 60, one; 64, one; 66, one). Femoral pores 17 to 21 (17, four; 18, three; 19, eight; 20, twelve; 21, three).

No geographical correlation has been discerned in the above variation.

Habits and habitat.—The species appears to be terrestrial. The specimen taken on Monte Alban was found running about on the ground at the side of a trail near the crest of the mountain. Specimens collected near Tehuacán were also discovered on the ground. The species seems to have a rather wide ecological range, as Jalapa, Tehuacán, and Oaxaca are widely different in vegetation and rainfall.

Locality records.—VERA CRUZ: Jalapa (Günther, 1890). PUEBLA: Matamoros Izucar (Cope, 1885); near Alseseca, km. 196 (EHT 7638);

20 km. N of Tehuacán, km. 226 (EHT 7639–41); between San Sebastian and Venta Salada (AMNH 18505–9); Santa Catarina (AMNH 18512); 10 mi. S of Cañada de Morelos (EHT 7631, 7631A); 10 mi. NE of Tehuacán (EHT 7630); near Zapotitlán (EHT 7632, 7635); near Tehuacán (EHT 7636). OAXACA: near Chazumba (EHT 7633–4); Monte Alban, S of Oaxaca (EHT 7641A).

Sceloporus scalaris scalaris Wiegmann.[1]

Sceloporus scalaris Wiegmann, Isis, **21**, p. 370, 1828; idem, Herp. Mex., p. 52, pl. 8, fig. 2, 1834; Gravenhorst, Nova Acta Acad. Leop., **18**, p. 765, 1837; Fitzinger, Syst. Rept., **1**, p. 75, 1843; Baird and Girard, in Stansbury, Explor. Great Salt Lake, pp. 346, 347, 1852; Lichtenstein, Nomen. Rept. Amph., p. 9, 1856; Hallowell, U. S. Pacif. R. R. Explor. Surv., **10**, Lieut. Williamson's Rept., p. 6, 1859; idem, Proc. Acad. Nat. Sci. Phila., 1860, p. 482, 1861; Müller, Reisen Ver. Staaten, Canada, Mex., **3**, p. 602, 1865; Peters, Monatsber. Akad. Wiss. Berlin, p. 875, 1869; Sumichrast, Bibl. Univ. Rev. Suisse, **46**, p. 243, 1873; Bocourt, Miss. Sci. Mex., Zool., **3**, sec. 1, pp. 202–205, pl. 18bis, figs. 9, 9 *a*, 9 *b*, 1874 (part); Dugès, Naturaleza, **4**, p. 30, 1877; Sumichrast, Naturaleza, **6**, p. 38, 1882; Cope, Proc. Amer. Phil. Soc., **22**, pp. 396–397, 1885 (part); Boulenger, Cat. Liz. Brit. Mus., **2**, pp. 218, 234–235, 1885; Ferrari-Perez, Proc. U. S. Nat. Mus., **9**, p. 193, 1886; Cope, Bull. U. S. Nat. Mus., **32**, p. 36, 1887 (part); Dugès, Naturaleza, (2), **1**, pp. 111–112, 1888 (part); Garman, Bull. Essex Inst., **19**, p. 132, 1887 (part); Herrera, Naturaleza, (2), **1**, pp. 330–331, 1890; Günther, Biol. Cent.-Amer., Rept. Batr., pp. 73–74, 1890 (part); Ives, Proc. Acad. Nat. Sci. Phil., **1891**, p. 462, 1892; Stejneger, Proc. U. S. Nat. Mus., **14**, pp. 486, 487, 1891; Herrera, Naturaleza, (2), **2**, pp. 46, 50, 61, 65, 69, 1891; idem, Cat. Rept. Mus. Nac., Mex., p. 18, 1895; Cope, Amer. Nat., **30**, pp. 1021, 1022, 1025, 1896; Dugès, Naturaleza, (2), **2**, p. 480, 1896 (part); Boulenger, Proc. Zool. Soc. Lond., **1897**, pp. 515–516, 1897 (part); Cope, Ann. Rept. U. S. Nat. Mus., **1898**, pp. 401–403, fig. 68, 1900 (part); Herrera, Cat. Rept. Nac. Mus. Mex., 2nd ed., p. 18, 1904; Stejneger, Proc. Biol. Soc. Wash., **17**, p. 19, 1904; Gadow, Proc. Zool. Soc. Lond., **2**, pp. 195, 214, 230, 232, 1905 (part); idem, Zool. Jahrb., Syst., **29**, pp. 706, 713, 714, 1910; Jones, Occ. Papers Mus. Zool. Univ. Mich., **172**, p. 3, 1926; Gadow, Jorullo, pp. 49, 51–52, 53, 1930 (part); Smith, Proc. Biol. Soc. Wash., **47**, pp. 124, 125, 1934; idem, Trans. Kans. Acad. Sci., **37**, p. 272, 1934.

Tropidolepis scalaris Gray, in Cuvier, Animal Kingdom, Griffith ed., **10**, [App.], p. 44, 1831; Duméril and Bibron, Erp. Gén., **4**, pp. 310–311, 1837; Gray, in Richardson and others, Zool. Capt. Beechey's Voy. Pacif., p. 95, pl. 30, fig. 3, 1839; idem, Cat. Liz. Brit. Mus., p. 210, 1845; Duméril and Duméril, Cat. Méth., p. 77, 1851; Jan, Cenni. Rept. Mus. Milano, p. 39, 1857; Dugès, Naturaleza, **1**, p. 143, 1870; Westphal-Castelnau, Congr. Scient. France, **35**, p. 285, 1872.

[1] See synonymy under *scalaris slevini* and *variabilis marmoratus* for other references to "scalaris." The *Sceloporus scalarus* of Müller (1878) said to be from Cuba, evidently rests on error.

Sceloporus scalaris scalaris Smith, Occ. Papers Mus. Zool. Univ. Mich., **361**, pp. 2–3, 1937.

Type locality.—Mexico.

Distribution.—Central Durango southward over the central and southern parts of the Mexican Plateau, except (apparently) Guerrero (fig. 56).[1]

Diagnosis.—A *Sceloporus* of moderate size, maximum snout-vent measurement 78 mm.; head scales rugose or keeled; two canthals; usually two complete rows of lorilabials below subocular; dorsal scales usually 39 to 49, average 43.5; ventral scales 35 to 45, average 41; scales around body 34 to 45, average 40.8; femoral pores 12 to 19 on each side, average 16.1, the two series usually separated medially by one or more scales; scales on posterior surface of thigh granular; no postfemoral dermal pocket; lateral scales in rows parallel to the dorsal rows; tibia/head proportion usually more than 0.85. Brownish above, with a series of crescent-shaped darker spots on either side of middle of back, between a pair of dorsolateral light lines; sides of body with similar marks, extending onto the ventral surface in males; a black spot on shoulder, enclosing a small blue spot; gular region barred in both sexes; sides of abdomen in males with a narrow pale blue area, barred with dark blue or black; dorsal surface of tail with chevron-shaped dark brown spots, rarely with a continuous median brown line.

Description.—Head scales keeled; parietal subtriangular, about two-thirds size of supraorbital area; parietals very small, usually two on each side; frequently one frontoparietal on each side, occasionally two; frontal usually touching interparietal; frontoparietals never in contact medially; frontal transversely divided, rarely divided into three or four scales; supraoculars four to seven, commonly five, separated from median head scales by a usually complete row of relatively large scales, from superciliaries by three irregular rows of smaller scales; superciliaries six; prefrontals usually in contact medially, frequently separated by an azygous scale; median frontonasal seldom irregularly divided or separated from lateral frontonasals; internasals irregular or in two to three irregular pairs; two postrostrals; subnasal present, large; two canthals, subequal in size, the first occasionally forced above canthal ridge by contact of second canthal and subnasal; usually a single loreal; preocular generally divided; three postoculars; usually two complete rows of lorilabials

[1] Hallowell's report of this species from Nicaragua (1860) is believed to be based on misidentification of *squamosus*.

below subocular; three and one-half to four supralabials and four infralabials to a point below middle of eye.

Mental pentagonal, with a labial border about two-thirds that of rostral; mental usually rather deeply notched laterally at point of contact with infralabials; three or four postmentals, the anterior scale of either series in contact with its fellow medially, the others separated; outer row of labiomentals terminating anteriorly between first postmental and first infralabial; inner row terminating below posterior part of second and anterior part of third infralabial; gular scales smooth, notched, smaller anteriorly and below ear.

Auricular lobules short, broad, three or four in number, pointed, smooth, smaller than or subequal in size to preceding scales; temporal scales keeled, weakly mucronate, subequal to scales between ear and lateral nuchal pocket; latter scales strongly keeled and mucronate; a file of very strongly keeled scales surmounting a weak fold extending from lower edge of nuchal pocket to lower edge of ear; scales between arm and nuchal pocket weakly keeled, not or weakly mucronate, the smallest ones about one-half size of temporal scales; scales immediately above arm granular, not imbricating, those in axilla imbricating.

Dorsal scales keeled, mucronate, not or very weakly denticulate, in parallel rows; eleven rows of dorsals at rump; lateral scales in parallel rows, about two-thirds size of dorsal scales; upper lateral scales more strongly mucronate than dorsals, lower lateral scales smooth, notched; ventral scales more oval in shape than laterals, smooth, notched; preanal scales smooth in both sexes, subequal in size to ventral abdominal scales.

Dorsal scales of foreleg keeled, mucronate, about two-thirds size of dorsal scales on body, those on lower foreleg denticulate; ventral scales of lower foreleg keeled, mucronate, about one-half size of dorsals of same member; scales on anterior surface of lower foreleg smooth; scales on lower surface of upper foreleg smooth, notched, very small distally and proximally on the limb, larger medially; lamellar formula for fingers 7–11–16–15–9 (7–10–16–16–9).

Dorsal scales of hind leg keeled, mucronate, those on thigh about two-thirds size of dorsals on body, those on shank about one-half; scales on lower anterior and ventral surfaces of thigh smooth, notched, slightly decreasing in size toward femoral pore series; scales on ventral and posterior surfaces of shank smooth, pointed, larger than dorsal scales of same member; scales on ankle very small; lamellar formula for toes 8–12–15–19–12 (7–10–15–20–13).

Dorsal scales of tail about one and two-thirds times as large as dorsals on body, strongly keeled and mucronate; subcaudals smooth near base of tail, becoming keeled distally; enlarged postanals present in males.

Coloration.—General ground color above reddish-brown, with distinct narrow whitish dorsolateral lines on each side, each following a single scale row from ear to base of tail; seven to eight rows of scales separate the two lines; in some specimens, an indistinct lateral line is present, passing from a point above and behind the axilla to the groin; usually a broad brown mid-dorsal band one or two scales wide, extending from the occiput to the base of the tail; a series of from ten to thirteen black crescentic spots, the concavity directed anteriorly, and bounded posteriorly by a narrow light streak, on each side of median dorsal band, limited laterally by the dorsolateral lines; these coalesce on the tail to form a single series of V-shaped marks; a series of from seven to nine crescentic marks similar to those on the back but less distinct between the dorsolateral and lateral lines; narrow black bands, bordered distally by narrower white bands, traverse the limbs; on the shoulder a bright black spot which encloses a small, brilliant, more or less iridescent blue spot.

A broad dark brown band extending from the lower portion of the orbit to the tympanum, bordered below by a narrow light line; labia not barred; another broad brown band traversing the interocular region, extending laterally to the superciliaries.

The females closely resemble the males except in ventral coloration. The venter in the former is dirty white, usually with a few brownish to blackish transverse or longitudinal streaks along the sides of the abdomen and similar oblique marks on the throat between the gular and labial regions. In males, the lateral abdominal region is light blue, shading gradually into the light brown of the sides. Black streaks are present as in females, but are much more distinct in full-grown specimens.

Variation.—The following data on variation in head scutellation have been taken from 65 specimens. Parietals one to three (1, four; 2, one hundred and seventeen; 3, four); frontoparietals one or two (1, one hundred and five; 2, twenty-four); frontal touches interparietal in 59, separated by an azygous scale in six; anterior section of frontal divided into three scales in four, longitudinally divided in one; posterior section of frontal transversely divided in two, longitudinally divided in one; seven superciliaries on one side in four, six in others; supraoculars four to seven (4, twelve; 5, eighty-six; 6, twenty-six;

7, five); in eight specimens one or more supraoculars contact median head scales; prefrontals contact medially in 36, separated by contact of frontal and median frontonasal in 4, by an azygous scale in 25; median frontonasal divided into two or more scales in two, separated from lateral frontonasals on one side in one, on both sides in four; internasals irregular in 32, two pairs in 21, three pairs in 12; first canthal forced above canthal ridge on one side in one, on both sides in seven; one canthal on one side in one (the two canthals partially fused on both sides in one specimen); first canthal touching lorilabials on one side in one; preocular divided on both sides in 47, on one side in one, partly divided in two, entire on both sides in 14; loreals one or two (1, one hundred and nine; 2, nineteen) (fused with first canthal on one side in one); three postrostrals in one, four in one, two in 63; two complete rows of lorilabials below subocular on one side in 12, on both sides in 34; rows incomplete (interrupted by one or more scales in contact with both subocular and supralabials) on both sides in 19.

Dorsal scales 36 to 49, average 43.5 (61 specimens: 36, one; 38, one; 39, two; 40, six; 41, nine; 42, twelve; 43, eight; 44, three; 45, eight; 46, six; 47, six; 48, six; 49, one); ventrals 35 to 45, average 41 (52 specimens: 35, one; 37, three; 38, six; 39, ten; 40, seven; 41, seven; 42, seven; 43, six; 44, three; 45, seven); scales around body 34 to 45, average 40.8 (58 specimens: 34, one; 36, one; 37, four; 38, four; 39, seven; 40, seven; 41, thirteen; 42, seven; 43, five; 44, five; 45, four). Femoral pores 12 to 19, average 16.1 (120 counts: 12, one; 13, five; 14, twelve; 15, twenty-three; 16, twenty-eight; 17, thirty-one; 18, fifteen; 19, five). Scales between femoral pore series none to three (0, fourteen; 1, twenty; 2, twenty-five; 3, two).

One specimen, certainly aberrant, from Hacienda Magdalena, Durango, has a very high dorsal scale count (57). Two specimens from Coyotes, Durango, have very low tibia/head proportions (82.8, 83.7).

Habits and habitat.—Gadow (1905, p. 214) states that *scalaris* is ovoviviparous, being gravid in the months from July to September. I am inclined to doubt this, as no specimens have been observed with young, although many have been found to contain eggs. Moreover, Herrera (1890) states that it reproduces in June, July, and August, and that it deposits eggs in tilled fields.

The observations of Herrera (op. cit.) on the habitat of this species correspond with my own observations of specimens in Michoacán: "As is indicated by its common name (plains lizard), it is

abundant in the dry and arid plains, where it is seen with difficulty, because its own color is confounded with the yellowish tint of the soil; it is encountered in abundance also along the edges of ditches."

The subspecies apparently does not occur below 5,000 feet. Gadow (1905) records the form from elevations as great as 14,000 feet; I am inclined to think he has confused *aeneus* with *scalaris*.

Locality records.—DISTRITO FEDERAL: Peñon (ANSP 8538–4; MVZ 12038); Lake Xochimilco (ANSP 12456); Valley of Mexico (ANSP 12457–62); 2 mi. W of Xochimilco (AMNH 15522); ½ mi. W of Santa Lucia (AMNH 15525); S of Tlalpam (AMNH 15526); 2 mi. N of Guadelupe (AMNH 17967); Guadelupe (FMNH 17095 [15]); 2 mi. N of Mixcoac (AMNH 17968); E of Peñon de los Baños (AMNH 17970); S of Santa Fé (AMNH 17965); near Mexico City (UMMZ 75821 [2]); USNM 46877–9; MCZ 4541); Sierra de Ajusco (Gadow, 1905). DURANGO: Coyotes (FMNH 1508–9); Hda. Magdalena (USNM 47063). GUANAJUATO: 3 mi. NE of Santa Rosa (EHT 7696); "Guanajuato" (ANSP 12482–4; USNM 12683, 12678). HIDALGO: Zacualtipan (ANSP 14733–4); Velasco (UMMZ 71451 [3]). JALISCO: Zapotlán (AMNH 15523–4); Colotlán (USNM 46635); Mesquitic (USNM 46636–7). MEXICO: Tetzcozingo (AMNH 17966); Lake Texcoco (FMNH 1008 [2]); San Juan Teotihuacán (MCZ 16032–3). MICHOACÁN: (USNM 26134–6, 9868–70); near Lake Cuitzeo (EHT 7685–6); Pátzcuaro (FMNH 1007 [4]); near Zinapécuaro (EHT 7687–95); Huingo (FMNH 1006 [3]); Queréndaro (USNM 46895); Tupátaro (Dugès, 1896); San Rafael, 8,000 feet, S of Pátzcuaro (Gadow, 1930); Apícuaro (Gadow, 1930). PUEBLA: Puebla (AMNH 18485); Atlixco (USNM 46779). ZACATECAS: Monte Escobedo (USNM 46639–43).

Sceloporus scalaris slevini Smith.

Sceloporus scalaris Baird, in Wheeler, U. S.-Mex. Bound. Surv., **2**, pt. 2, No. [3], p. 6, 1859; Cope, Bull. U. S. Nat. Mus., **1**, p. 49, 1875; Coues, U. S. Geog. Surv. W. 100th Mer., **5**, p. 595, 1875; Garman, Bull. Essex Inst., **16**, p. 17, 1884; Cope, Proc. Amer. Phil. Soc., **22**, pp. 396–397, 1885 (part); Garman, Bull. Essex Inst., **19**, p. 132, 1887 (part); Günther, Biol. Cent.-Amer., Rept. Batr., pp. 73–74, 1890 (part); Van Denburgh, Proc. Calif. Acad. Sci., (2), **6**, p. 341, 1896; Cope, Ann. Rept. U. S. Nat. Mus., **1898**, pp. 401–403, fig. 68, 1900 (part); Stejneger, Proc. U. S. Nat. Mus., **25**, p. 150, 1902; Ditmars, Rept. Book, pp. 130, 140, 1907; Van Denburgh and Slevin, Proc. Calif. Acad. Sci., (4), **3**, p. 392, 1913; Strecker, Baylor Bull., 18, No. 4, p. 22, 1915; Stejneger and Barbour, Check List N. Amer. Amph. Rept., p. 56, 1917; Van Denburgh, Copeia, **1922**, p. 39, 1922; idem, Occ. Papers Calif. Acad. Sci., **10**, pp. 268–273, pl. 19, 1922; Stejneger and Barbour, Check List N. Amer. Amph. Rept., 2nd ed., p. 58, 1923; idem,

3rd ed., p. 64, 1933; Slevin, Handb. Rept. Amph. Pacif. States, pp. 44, 52, 1934; Burt, Trans. Kans. Acad. Sci., **38**, pp. 275, 299, 305, 1936; Ditmars, Rept. N. Amer., pp. 49, 57–58, 59, 1936; Dunn, Proc. Acad. Nat. Sci. Phila., **88**, p. 473, 1936 (part); Gloyd, Bull. Chicago Acad. Sci., **5**, pp. 88, 98, 112, 1937.

Sceloporus scalaris slevini Smith, Occ. Papers Mus. Zool. Univ. Mich., **361**, pp. 3–4, 1937.

Type locality.—Miller Peak, Huachuca Mountains, Arizona. Type CAS 48103, collected by Joseph R. Slevin, July 7, 1920.

Distribution.—Southern Arizona, south to northern Durango, west a short distance into Sonora, and east to Nuevo León (fig. 56).

Diagnosis.—A small *Sceloporus*, maximum snout-vent measurement about 61 mm.; head scales rugose or keeled; one canthal; dorsal scales 37 to 46, average 41.5; scales around body 38 to 45, average 41.1; ventral scales 35 to 45, average 41; lateral scales in parallel rows; femoral pores 12 to 18, average 14.1, the two series separated by not more than two scales, or in contact; scales on posterior surface of thigh granular; no postfemoral dermal pocket; length of tibia averages 82.1 per cent that of head (snout-occiput). Coloration similar to that of *s. scalaris*, but lateral light lines on body and head distinct; transverse bars below lateral light lines very short or absent, not entering lateral abdominal patches, which are uniform navy blue in males; ventral surfaces immaculate, save the belly patches in males; a black spot on shoulder, enclosing a small blue spot; tail with a continuous median dorsal dark-brown or black line covering two half scale rows.

Description of type.—Cephalic scales keeled or rugose; numerous pits about margins of median cephalic scales, and on posterior margins of other dorsal head scales; rostral about four times as broad as long, bordered posteriorly by two postrostrals; nasal large, separated from rostral, the posterior part forming a very narrow border about naris; four elongate internasals, followed posteriorly by a row of three small, irregular scales; these followed posteriorly by two scales in contact medially, each about as large as nasal; on each side of these, a small scale contacting canthal laterally; two or three small scales posterior to nasal; three frontonasals, subequal in size, typical, the median separated by a small, azygous scale from the frontal; two prefrontals, separated medially; frontal normal, the anterior section with a distinct, median groove formed by two lateral ridges; interparietal extremely large, about three times as large as ear, about equal to size of supraorbital area; frontal broadly in contact with interparietal; two frontoparietals on each side; three parietals on

each side; five large supraoculars, separated from median head scales by a single row of small scales, from superciliaries by one complete and one incomplete series of small scales; five or six superciliaries visible from above; one canthal, contacting subnasal and loreal, separated from nasal by one or two small scales, and from preocular by a small scale; nearly half the length of canthal forming part of superciliary series; three postoculars; three supralabials and four infralabials to a point below middle of eye.

Mental more or less pentagonal, its labial border about two-thirds that of rostral; four pairs of postmentals, the scales of the anterior pair in contact medially, the others separated; outer row of labiomentals separated from mental; median gular scales smooth, with a single or double indentation on their posterior edges, about one-half as large as median abdominals, and about equal in size to preanals.

Temporal scales and scales on neck anterior to a line between upper edges of ear openings keeled, but not mucronate; two large auricular lobules, smooth and mucronate, slightly larger than scales immediately preceding; a deep, lateral nuchal pocket, the fold without enlarged scales; scales between ear and nuchal pocket keeled and weakly mucronate, larger than those between pouch and insertion of foreleg; latter scales keeled, not or weakly mucronate; one or two rows of small scales below ear weakly keeled.

Dorsal, lateral, and ventral scales in parallel rows; dorsals slightly larger than ventrals, laterals slightly smaller than ventrals; all dorsal scales keeled, mucronate, a few with a single lateral mucrone on each side, or a notch; six rows of scales on either side lateral to the dorsolateral light lines, keeled, other lateral scales smooth, strongly notched; ventral scales smooth, usually with a single, rarely a double, indentation, not so deep as in lateral scales; scales in axilla and groin small but squamous; dorsal caudal scales strongly keeled and mucronate; subcaudals more weakly keeled and mucronate, smooth at base of tail; scales on dorsal and anterior surfaces of foreleg (except hand) about one-half as large as dorsals of body, keeled, weakly mucronate; dorsal scales of hand and digits smooth, smaller; scales on posterior and ventral surfaces of foreleg keeled, much smaller than dorsals of same member, those on lower foreleg somewhat larger; lamellar formula for fingers 6–10–15–15–9.

Dorsal scales on thigh about two-thirds size of dorsals on body, keeled, mucronate; anterior and ventral scales of same member smooth, some notched; posterior scales on thigh very small, granular;

scales about shank nearly subequal in size, the dorsals about equal in size to those on thigh, those on anterior surface about one-half as large and keeled, the rest smooth; lamellar formula for toes 8–11–16–19–13; femoral pores 13–14, the two series separated medially by a single scale; a pair of enlarged postanals.

Coloration.—General ground color light brown; a dark-edged dorsolateral light line on each side of the body, less than one scale wide, separated by seven to eight scale rows, originating in parietal region of head and confluent anteriorly with a broad light band through lower portion of orbit; on each side of mid-dorsal line a series of twelve crescentic blackish-brown spots, the posterior edge of each spot successively black- and light-bordered; a lateral light line from labial region of head to middle of ear, continued posteriorly from upper edge of ear onto femur; between dorsolateral and lateral light lines a series of crescentic spots similar to those on dorsum; below lateral light line a narrow area of brown, spotted with darker, in turn bordered by a reddish-brown band; below this band a bright blue ventral patch three or four scales wide, extending from near axilla to groin; limbs and head with a few irregular dark markings; a black spot in front of shoulder, light-bordered posteriorly, inclosing a bright blue spot; dorsal spots convergent on tail, forming a mid-dorsal dark brown stripe; ventral surfaces immaculate except for lateral abdominal blue patches and a few brownish striations in lateral nuchal region. Van Denburgh (1922, pp. 270–271) presents added details of coloration.

Variation.—The following data on variation of head scutellation have been taken from 40 specimens. Parietals one to three (1, six; 2, sixty-eight; 3 four); frontoparietals one or two (1, fifty-two; 2, twenty-two); frontal touches interparietal in all but one, in which an azygous scale separates it; anterior section of frontal longitudinally divided in two, posterior section similarly divided in one; superciliaries six in all; supraoculars four or five (4, forty; 5, twenty-seven); eight specimens with one or more supraoculars in contact with median head scales; prefrontals in contact medially in 13, separated by contact of frontal with median frontonasal in nine, by an azygous scale in 17; frontonasals normal in all; internasals irregular in 18, two pairs in 17, three pairs in four; canthals one in all; preocular entire on both sides in three, on one side in one, divided on both sides in 36; loreals one or two (1, sixty-seven; 2, nine), fused with subnasal on one side in three specimens; two postrostrals in all; two complete

rows of lorilabials below subocular in 50, incomplete (interrupted by one or more scales contacting both subocular and lorilabials) in 30.

Dorsal scales 37 to 46, average 41.5 (44 specimens: 37, one; 38, one; 39, three; 40, six; 41, ten; 42, twelve; 43, four; 44, six; 46, one); ventrals 35 to 45, average 41 (34 specimens: 35, one; 36, one; 37, two; 38, four; 40, four; 41, five; 42, seven; 43, five; 44, three; 45, two); scales around body 38 to 45, average 41.1 (37 specimens: 38, three; 39, five; 40, five; 41, eleven; 42, four; 43, five; 44, two; 45, two). Femoral pores 12 to 18, average 14.1 (86 counts: 12, six; 13, twenty-one; 14, twenty-seven; 15, twenty-five; 16, four; 17, two; 18, one). Scales between series of femoral pores none to two (0, nine; 1, eighteen; 2, twelve).

In one specimen from Chihuahua, the portion of the canthal which, in other specimens, extends into the superciliary region, is missing, apparently fused with the lateral frontonasals, which are larger than usual. The lobules on the anterior margin of the ear are variable, larger than the preceding scales in some specimens, smaller in others.

Variations in coloration are very slight, with the exception of a peculiar color phase in which the color pattern is entirely lost. This occurs in both sexes, and in specimens of moderate as well as of large size. Van Denburgh (1922, p. 271) describes a male (CAS 48101, from Miller Peak, Huachuca Mountains) in detail.

In females the dark spot in front of the shoulder is almost obsolete, and the entire ventral surface is immaculate.

Comparisons.—The characters which separate this subspecies from *s. scalaris* are given in the diagnosis. The two forms contrast further as follows: Maximum snout-vent measurement 61 mm. in *s. slevini* (78 mm. in *s. scalaris*); tibia/head proportion usually less than 0.90 in *s. slevini* (usually more than 0.90 in *s. scalaris*); one canthal in *s. slevini* (two in *s. scalaris*); belly immaculate except for lateral abdominal uniform blue areas in males in *s. slevini* (gular region and sides of abdomen barred with black or dark blue in *s. scalaris*); tail with a continuous, median dorsal dark stripe in *s. slevini* (tail with dark, V-shaped bars dorsally in *s. scalaris*). The tibia/head proportion averages 81.7 in male *scalaris* and 82.4 in females, while in *slevini* the corresponding figures are 101.3 and 94.9. The proportion is lower in the smaller specimens of both sexes.

Relationships.—The relationships and proper status of *s. slevini* have been, and still are, a problem. I have tentatively associated it with *s. scalaris* for the following reasons: same general type of

ventral coloration as in *s. scalaris;* range more nearly in contact with that of *s. scalaris* than with any other of the group; general tendency of extreme northern *s. scalaris* to reduce tibia/head proportion.

It is also possible that *s. slevini* is a derivative of *aeneus aeneus.* I disregard *aeneus bicanthalis,* as it is confined to eastern Mexico and has two canthals. The arguments for derivation from *aeneus aeneus* are: similar habitus; similar habits (*s. slevini* is found in clumps of grass; I have always collected *aeneus aeneus* in grass clumps, while *s. scalaris* was found in more or less open places); a single canthal in both; tibia in both relatively short; appearance in *s. slevini* of occasional specimens without dorsal markings, as in *aeneus aeneus;* this phenomenon rarely if ever occurs in *s. scalaris* (the only specimens of the latter species observed without pattern or with an indistinct one have been in poor condition); occurrence in both *aeneus aeneus* and *s. slevini* of a median, dorsal, caudal dark stripe. There are, however, almost irrefutable arguments which indicate that this disposition of *s. slevini* would be incorrect: the ventral coloration of *s. slevini* is greatly different from that of *aeneus aeneus* (*a. bicanthalis,* having the sides of the abdomen definitely blue, although heavily reticulated with black, gives evidence that primitive *aeneus* stock had the belly colored as in *scalaris*); the general distributional trend of *aeneus* is northward, as the two subspecies are closely associated toward the south, widely separated toward the north; the *aeneus* stock would not be expected to lose the primitive belly coloration, then redevelop it; and a wide hiatus between the ranges of *s. slevini* and *a. aeneus.*

Habits and habitat.—Mr. Joseph R. Slevin supplies the following notes: "These particular specimens from the Huachuca Mountains were taken just below Miller Peak; that is, at the base of the large rocky summit. There is a small patch of grass at the base of the rocks forming the summit, and the lizards were found hiding in these. In hunting for them I visited each tuft of grass, pulling it apart to see what was hiding and there were the lizards down about the roots and well concealed. I did not see a single one in the open."

Locality records.[1]—ARIZONA: Carr Peak, Huachuca Mts. (SDSNH 14859); Montezuma Canyon, Huachuca Mts. (AMNH 14950–6, 14958–65, 14987, 15045, 18348–50, 18050); Miller Peak, Huachuca Mts. (CAS 48101–4; SDSNH 14860); Ramsey Canyon, Huachuca

[1] A single specimen in the American Museum of Natural History (No. 409) purports to be from Real de Pinos, Gulf of California. The specimen appears to be a typical *s. slevini.*

Mts. (UMMZ 69853, 71140–1; MCZ 29837–8; SDSNH 14857–8); Huachuca Mts. (MCZ 14889–95, 32795; LSJU 796, 2186, 2646, 2120, 2185, 2618); Tombstone (FMNH 911); Nogales to Rio Grande (USNM 2884); Santa Rita Mts. (CAS 48105); Long Peak, Chiricahua Mts. (SDSNH 15831).

SONORA: San José Mt. (USNM 21031). CHIHUAHUA: Pacheco (CAS 50495–6, 50500; UMMZ 71770 [6]; MCZ 15628–33, 15635); Mound Valley (MCZ 19998); Meadow Valley (USNM 26601, 26599); Guadelupe y Calvo (USNM 47064–5); Chihuahua (city?) USNM 58444); 30 mi. S of El Paso (Strecker, 1915); Madero Canyon, Tureze (BYU 2041). DURANGO: Guasamota (USNM 46626). COAHUILA: Concordia, 30 mi. N of Saltillo (MCZ 4566). NUEVO LEÓN: Hda. Pablillo, above Galeana (ANSP 20004).

Sceloporus scalaris unicanthalis Smith.

Sceloporus scalaris Bocourt, Miss. Sci. Mex. Zool., **3**, sec. 1, pp. 202–205, 1874 (part); Dugès, Naturaleza, (2), **1**, pp. 111–112, 1888 (part); Günther, Biol. Cent.-Amer., Rept. Batr., pp. 73–74, 1890 (part); Dugès, Naturaleza, (2), **2**, p. 480, 1896 (part); Boulenger, Proc. Zool. Soc. Lond., **1897**, pp. 515–516, 1897 (part).

Sceloporus scalaris unicanthalis Smith, Occ. Papers Mus. Zool. Univ. **361**, pp. 4–5, 1937.

Type locality.—Magdalena, Jalisco. Type EHT 7699, collected by H. M. Smith.

Distribution.—Known only from the southern border of the Mexican Plateau in central Jalisco, from the eastern border of Lake Chapala westward to Nayarit (fig. 56).

Diagnosis.—A *Sceloporus* of moderate size, maximum snout-vent measurement 65 mm.; similar to *s. scalaris* in all characters except: scales of the second pair of postmentals usually in contact medially; one canthal; gular region usually not barred; sides of belly without dark markings passing through the belly patches. Differing from *s. slevini* in the character of the postmentals; average dorsal scale count; maximum size (61 mm. in *s. slevini*); and ratio of tibia to snout-occiput measurement (91.4 to 108.8 in *s. unicanthalis*, 72.7 to 93.7 in *s. slevini*).

Remarks.—Ten specimens of *scalaris unicanthalis* have been available for study. They seem to be more or less intermediate between *s. scalaris* and *s. slevini*, yet certain characters differentiate them from the two other subspecies. The area occupied by *scalaris unicanthalis* is remote from the known range of *s. slevini*, while it is adjacent to that of *s. scalaris*. Since these specimens afford evidence

of a considerable population differing consistently from related populations and occupying a large area by itself, they appear to represent a valid race.

A single specimen of the 35 *s. scalaris* examined for the character of the postmental scales has the scales of the second pair in contact medially. In the remainder, one to three small scales separate them. The single exception, a specimen from Querén-daro, Michoacán, is intermediate between *s. scalaris* and *s. unicanthalis* in the character of the canthal scales, having one on one side, two on the other.

The scales of the second pair of postmentals are separated medially in the 17 *s. slevini* examined for this character. Two specimens of *s. unicanthalis* have the scales of the second pair of postmentals separated medially. One is from Atemajac, Jalisco, the other from Jamay, Jalisco. All specimens examined have a single canthal.

Two *s. scalaris* from Zapotlán, Jalisco, near the range of *s. unicanthalis*, have the lowest scale counts in the subspecies (36, 38).

Locality records.[1]—Jalisco: Magdalena (EHT 7699–7700); 5 mi. W of Magdalena (AMNH 15521); Hda. de Capulines (AMNH 17979); Oblatos, NE of Guadalajara (AMNH 17964); S of Tlaquepaque (AMNH 18989); Jamay (AMNH 17980–2); Atemajac (USNM 47884); Guadalajara (Dugès, 1887); N of Rio Santiago (Günther, 1890).

Sceloporus goldmani Smith.

Sceloporus goldmani Smith, Occ. Papers Mus. Zool. Univ. Mich., **361**, p. 5, 1937.

Type locality.—Charcas, San Luis Potosí. Type UMMZ 80896, collected by C. L. Lundell.

Distribution.—Southern Coahuila southward in the central part of the Mexican Plateau to central San Luis Potosí (fig. 56).

Diagnosis.—Similar in most respects to *Sceloporus scalaris scalaris;* lateral scales in definitely oblique rows, not parallel as in *scalaris, aeneus,* and their subspecies; dorsal scales 50 to 55; scales around body 40 to 49; ventral scales 42 to 48; two canthals, the first rarely above canthal ridge; head scales rugose; scales on posterior surface of thigh granular; no postfemoral dermal pocket; femoral pores 14 to 19, the two series separated from each other by one scale, or none; ratio of tibia to snout-occiput measurement, 81.6 to 84.1;

[1] I collected a single specimen, which is now lost, at Ixtlán, Nayarit, in June, 1935.

two postrostrals; dorsolateral light lines present, enclosing two series of large crescent-shaped dark brown spots; a series of similar spots on sides of abdomen; gular region irregularly barred in both sexes; in males, sides of abdomen pale blue, with short dark brown or black transverse bars.

Description of type.—Dorsal head scales keeled, pitted; interparietal large, about two-thirds size of supraorbital area; two small parietals on each side; one small frontoparietal on each side, the two separated medially by contact of frontal and interparietal; frontal transversely divided; eight enlarged supraoculars on each side, bordered laterally by a row of six smaller supraoculars; one complete and another incomplete row of small scales between supraoculars and superciliaries; one complete row of small scales between supraoculars and median head scales; six superciliaries on each side, five visible from above; prefrontals separated by an azygous scale; frontonasals normal; internasals irregular; nasals and internasals separated from rostral by two postrostrals; two canthals, normal; subnasal present, large; preocular divided; two rows of lorilabials, reduced to one row below subocular by a single scale in contact with subocular and supralabials; two postoculars; three and one-half to four and one-half supralabials, and four or five infralabials to a point below middle of eye.

Mental pentagonal, with a labial border about three-fifths that of rostral; lateral edges of mental strongly concave; four pairs of postmentals, the scales of only the first pair in contact medially; outer row of labiomentals narrowly separated from mental by partial contact of first infralabial and first postmental; gular scales smooth, subequal in size, with a single apical notch.

Auricular lobules three–four, very short, smaller than preceding scales; temporal scales keeled, not or weakly mucronate, the anterior scales the smallest, the largest subequal in size to scales between ear and nuchal fold; latter scales keeled, mucronate; scales between nuchal pocket and arm varying in size, the upper small, the lower larger, all smooth, rounded or notched; scales immediately above arm granular, well differentiated from the large scales preceding.

Dorsal scales in parallel rows, keeled, mucronate, weakly denticulate; lateral scales in oblique rows, the rows anteriorly nearly parallel to dorsal rows, posteriorly becoming strongly oblique; lateral scales similar to dorsals, slightly smaller; ventral scales smooth, entire (notched at sides of abdomen), about three-fourths size of dorsal scales; preanal scales smooth, slightly smaller than ventral abdominal scales.

Dorsal scales of foreleg subequal in size, keeled, weakly mucronate, about one-third or two-fifths size of dorsal body scales; ventral scales of lower foreleg slightly smaller than dorsal scales of same member, smooth posteriorly, keeled anteriorly and toward hand; ventral scales of upper foreleg smooth, granular in axilla and at elbow, the largest scales about two-thirds size of ventral scales of lower foreleg; lamellar formula for fingers 5–7–12–11–7 (5–7–12–12–8).

Dorsal scales of hind leg keeled, mucronate, subequal in size, about one-half size of dorsal body scales; scales on lower anterior surface of thigh smooth, notched; scales on posterior surface of thigh granular; ventral scales of thigh similar, gradually decreasing in size toward series of femoral pores; ventral scales of shank smooth, not notched, subequal in size to dorsal scales of same member; lamellar formula for toes 6–9–12–16–11.

Dorsal caudal scales subequal in size to dorsal body scales, a little more strongly keeled; subcaudals smooth at base of tail, becoming more strongly keeled distally; no postfemoral dermal pocket; postanals enlarged in males.

Coloration.—Dorsal ground color olive-gray; head dull reddish-brown; a narrow dorsolateral light line on each side of body, extending from temporal region to sides of base of tail; between these light lines, two series of about 15 crescent-shaped brown-gray spots; each spot darker posteriorly, with a light posterior border confluent with dorsolateral light line; dorsal spots separated from each other by a distance about equal to their width; an area about one scale wide, extending from neck to base of tail, with no markings whatsoever; a series of crescent-shaped spots below dorsolateral light line, on sides of body, smaller than those on back; sides of body and abdomen, below the last-mentioned row of spots, with irregular dark-brown or black markings, with lighter spots arranged in a more or less barred pattern on sides near venter; limbs with narrow, distinct, dark brown bands; a dark streak down middle of tail. Entire venter white; narrow black bars on throat; sides of abdomen faintly mottled with black. A long narrow black shoulder patch extending from arm to nuchal pocket, bordered above by a narrower white bar.

The coloration of the paratypes is exactly similar to that of the female type, except that the males (all young) show evidence of a bluish patch on each side of the abdomen, and that the dorsal ground color is more brownish.

Comparisons.—This species differs from all others of the *scalaris* group, except *jalapae*, in the number of dorsal scales (49 maximum

in *scalaris, aeneus,* and their subspecies), and in having the lateral scale rows oblique instead of parallel. From *jalapae, goldmani* differs in having the nasals and internasals separated from the rostral by two postrostrals.

Locality records.—COAHUILA: Carneros (USNM 46869). SAN LUIS POTOSÍ: Charcas (UMMZ 77266, 77265 [4], 80896).

Sceloporus aeneus aeneus Wiegmann.

Sceloporus aeneus Wiegmann, Isis, **21**, p. 370, 1828; idem, Herp. Mex., p. 52, 1834; Fitzinger, Syst. Rept., **1**, p. 45, 1843; Duméril, Arch. Mus. Hist. Nat. Paris, **8**, p. 547, 1856; Lichtenstein, Syst. Rept., p. 9, 1856; Müller, Reisen Ver. Staaten, Canada, Mex., **3**, p. 602, 1865; Peters, Monatsber. Akad. Wiss. Berlin, **1869**, p. 875, 1869; Bocourt, Miss. Sci. Mex. Zool., **3**, sec. 1, pp. 205–206, pl. 16bis, figs. 4, 4 *a*, 4 *b*, 1874; Dugès, Naturaleza, **4**, p. 30, 1877; Cope, Proc. Amer. Phil. Soc., **22**, p. 379, 1885; Boulenger, Cat. Liz. Brit. Mus., **2**, pp. 218, 233–234, 1885 (part); Ferrari-Perez, Proc. U. S. Nat. Mus., **9**, p. 193, 1886; Cope, Bull. U. S. Nat. Mus., **32**, p. 36, 1887 (part); Günther, Biol. Cent.-Amer., Rept. Batr., p. 74, 1890 (part); Herrera, Cat. Rept. Mus. Nac., Mex., p. 17, 1895; Cope, Amer. Nat., **30**, p. 1022, 1896; Dugès, Naturaleza, (2), **2**, p. 479, 1896; Boulenger, Proc. Zool. Soc. Lond., **1897**, pp. 514–515, 1897 (part); Cope, Ann. Rept. U. S. Nat. Mus., **1898**, pp. 391–392, 1900; Herrera, Cat. Rept. Mus. Nac., Mex., 2nd ed., p. 17, 1904; Gadow, Proc. Zool. Soc. Lond., **2**, p. 232, 1905; idem, Through Southern Mexico, pp. 57, 63, 1908; idem, Zool. Jahrb., Syst., **29**, pp. 706, 713, 714, 1910 (part); idem, Jorullo, pp. 49, 51–52, 53, 1930; Ahl, Zool. Anz., **106**, p. 184, 1934; Smith, Trans. Kans. Acad. Sci., **37**, p. 272, 1934; idem, Proc. Biol. Soc. Wash., **47**, pp. 124, 125, 1934.

Tropidolepis aeneus Gray, in Cuvier, Animal Kingdom, Griffith ed., **10**, [App.], p. 44, 1831; Duméril and Bibron, Erp. Gén., **4**, pp. 309–310, 1837; Gray, Cat. Liz. Brit. Mus., p. 210, 1845; Duméril and Duméril, Cat. Méth., p. 78, 1851; Dugès, Naturaleza, **1**, p. 143, 1870.

Sceloporus aeneus aeneus Smith, Occ. Papers Mus. Zool. Univ. Mich., **361**, p. 6, 1937.

Type locality.—Mexico.

Distribution.—Western Puebla, to central western Michoacán and Jalisco; north on the plateau to northern Guanajuato (fig. 57).

Diagnosis.—A *Sceloporus* of small size, maximum snout-vent measurement 58 mm.; head scales rugose; one canthal; frequently two frontoparietals on each side; prefrontals usually separated by an azygous scale; dorsal scales 39 to 47, average 42.6; ventrals 35 to 46, average 41.4; scales around body 37 to 51, average 43.3; lateral scales in parallel rows; femoral pores 14 to 21, average 17.2; femoral pore series usually in contact medially; scales on posterior surface of thigh granular; no postfemoral dermal pocket; tibia/head proportion

averages 85.4. Brown or gray-brown above; an indistinct dorsolateral light line on each side; between these, two series of narrow dark bars; a black spot on shoulder, with a small blue spot on its anterior edge; sides of head without white lines; a series of similar bars on sides of body; females dusky below, the gular region sometimes nearly black; males heavily suffused with black below, sometimes with small scattered blue spots in gular region; younger males with irregular light spots near middle of abdomen and in gular region; gular region and belly never barred; entire ventral surface of body and limbs black in large males, and tail also heavily suffused with black; a continuous dark line down middle of tail. Otherwise as in *aeneus bicanthalis*.

Variation.—The following variational data on head scales have been taken from 88 specimens, unless otherwise stated. Parietals one or two (1, fifteen; 2, one hundred and sixty); frontoparietals one to three (162 specimens, 324 counts: 1, one hundred and ninety-seven; 2, one hundred and twenty-two; 3, five); frontal touches interparietal in 79; frontoparietals contact medially in 3, are separated by an azygous scale in six; anterior section of frontal longitudinally divided in one; superciliaries five to seven (5, two; 6, one hundred and sixty-three; 7, five); enlarged supraoculars three to six (none enlarged, three specimens), (3, one; 4, seventy-seven; 5, seventy-eight; 6, eleven); one or more supraoculars in contact with median head scales in 19 specimens; prefrontals contact medially in 70 specimens, are separated by an azygous scale in 90 specimens, and separated by contact of frontal and median frontonasal in one (161 specimens examined); median frontonasal broken into two or more scales in five, separated from lateral frontonasals on both sides in four, on one side in eight (162 specimens examined); one pair of internasals in one specimen, two pairs in 27, three pairs in 16, internasals irregular in 44; canthals one–one in 168, one–two in two specimens; preocular entire on both sides in three, on one side in three, divided on both sides in 82; loreals one or two (1, one hundred and fifty-five; 2, twenty-one); three postrostrals in one, two in 87; two complete rows of lorilabials below subocular in 100, incomplete (interrupted by one or more scales in contact with both subocular and supralabials) in 227 (164 specimens counted).

Dorsals 39 to 47, average 42.6 (87 specimens: 39, three; 40, nine; 41, fifteen; 42, thirteen; 43, nineteen; 44, twelve; 45, eight; 46, six; 47, one); ventrals 35 to 46, average 41.4 (64 specimens: 35, one; 36, one; 37, two; 38, four; 39, ten; 40, seven; 41, six; 42, eleven; 43,

eight; 44, five; 45, five; 46, four); scales around body 37 to 51, average 43.3 (73 specimens: 37, one; 38, five; 39, four; 40, seven; 41, six; 42, seven; 43, nine; 44, eight; 45, five; 46, nine; 47, two; 48, six; 49, one; 50, two; 51, one). These variational data have been checked for sexual dimorphism, but none is apparent. Femoral pores 14 to 21, average 17.2 (169 counts: 14, four; 15, sixteen; 16, thirty-four; 17, forty-five; 18, forty-one; 19, twenty-four; 20, four; 21, one). Scales between femoral pore series none or one (1, four; 0, eighty-four). The largest male examined measures 58 mm. snout to vent; the largest female reaches the same length. The subspecies appears to be quite uniform throughout its range.

Comparisons.—Since a complete description is offered for *a. bicanthalis,* and *a. aeneus* is very closely allied, it is sufficient to compare *a. aeneus* in detail with *bicanthalis* (the form in parentheses): one canthal (two); two frontoparietals on a side occurring in 34.6 per cent of the specimens examined (12.8 per cent); prefrontals separated medially by an azygous scale in 55.9 per cent of the specimens (40.8 per cent). *S. aeneus aeneus* and *S. a. bicanthalis* are well distinguished in the tibia/head proportion. This differs slightly in the sexes, averaging 88.8 in males (43) and 85.4 in females (39), in *aeneus,* the corresponding figures in *bicanthalis* being 78.5 (32) and 78.7 (57). This proportion changes with growth; in 5 male specimens of *a. aeneus* measuring 40–44 mm. it averages 85, while in the 23 specimens from 50 to 54 mm. long it averages 89.7; there is no significant change in female specimens. In *a. bicanthalis* the proportion in the smallest male specimens (20–24 mm.) is 71.5, while in adults (40–44 mm.) it is 80.5; and in females of this subspecies the average proportion in smaller specimens is only 64.2, reaching 85.3 in specimens 45–49 mm. in length. Belly in males becoming generally suffused with black with increasing age (belly and gular region barred, becoming more distinctly barred in larger males; barred pattern never lost); gular region in females suffused with black (gular region in females and young, if marked at all, with faint darker bars); sides of head without white lines (with white lines).

In all other characters *aeneus aeneus* appears to be exactly similar to *aeneus bicanthalis.*

Habits and habitat.—In the vicinity of Tres Cumbres (Tres Marias), Morelos, this subspecies was one of the most common collected. It was most frequently scared out of clumps of grass in which it hid. At Uruapán, Michoacán, a specimen was found

hiding under pine needles in a long, rather steep-sided ditch. The species is presumably ovoviviparous, as *a. bicanthalis* is known to be.

Locality records.—Distrito Federal: La Venta (AMNH 15492); Valley of Mexico (MCZ 33195). Guanajuato: near San Felipe (EHT 7904); Silao (Dugès, 1896); Guanajuato (Dugès, 1896). Guerrero: (?)Chilapa (Ahl, 1934) (possibly *ochoterenae*). Jalisco: N of Rio Santiago (Günther, 1890); La Cumbre de los Arrastrados (Boulenger, 1897); Hda. Santa Gertrudis (Boulenger, 1897). Mexico: Chalco (AMNH 5180; FMNH 1276 [39], 1277 [7], 995 [2]; MCZ 7471 [2]; CAS 38805); Amecameca (FMNH 1301 [8]); 2 mi. S of San Martín, near Zitácuaro (EHT 7878–95); 10 mi. W of Asunción (30 mi. from Zitácuaro) (EHT 7886–7903, 7496–9); 9 mi. NW of Toluca (EHT 7495); Desierto de los Leones (USNM 75344); Toluca (BYU 3084–5; FMNH 17096). Michoacán: near Uruapán (EHT 7905); 15 mi. SE of Zitácuaro (EHT 7464–93); 8 mi. E of Zinapécuaro (EHT 7494); Tupátaro (Dugès, 1896); San Rafael, 8,000 feet, S of Pátzcuaro (Gadow, 1930); Apícuaro (Gadow, 1930). Morelos: Tres Cumbres (Tres Marias) (EHT 7433–42, 7450–3, 7463). Puebla: Puebla (FMNH 1326 [2]); Popocatepetl (MCZ 16067–72).

Sceloporus aeneus bicanthalis Smith.

Sceloporus aeneus Peters, Monatsber. Akad. Wiss. Berlin, **1869**, p. 875, 1869; Cope, Proc. Amer. Phil. Soc., **22**, p. 170, 1885; idem, p. 379, 1885; Boulenger, Cat. Liz. Brit. Mus., **2**, pp. 218, 233–234, 1885 (part); Ferrari-Perez, Proc. U. S. Nat. Mus., **9**, p. 193, 1886(?); Cope, Bull. U. S. Nat. Mus., **32**, p. 36, 1887 (part); Günther, Biol. Cent.-Amer., Rept. Batr., p. 74, 1890 (part); Blatchley, Proc. U. S. Nat. Mus., **16**, pp. 40–41, 1893; Werner, Verh. Zool.-Bot. Ges. Wien., **46**, p. 346, 1896(?); Boulenger, Proc. Zool. Soc. Lond., **1897**, pp. 514–515, 1897 (part); Gadow, Proc. Zool. Soc. Lond., **2**, pp. 194, 214, 232, 1905 (part); idem, Zool. Jahrb., Syst., **29**, pp. 706, 713, 714, 1910 (part); idem, Jorullo, pp. 49, 51–52, 53, 1930 (part).

Sceloporus aeneus bicanthalis Smith, Occ. Papers Mus. Zool. Univ. Mich., **361**, pp. 6–8, 1937.

Type locality.—Cofre Perote, near Cruz Blanca, Vera Cruz. Type EHT 7939, male, collected by Edward H. Taylor.

Distribution.—Central Oaxaca, north along the eastern escarpment of the plateau to northern Hidalgo (fig. 57).

Diagnosis.—A small *Sceloporus*, maximum snout-vent measurement about 56 mm.; dorsal head scales rugose; two canthals on each side; usually one frontoparietal on each side; prefrontals more frequently in contact medially than separated; dorsal scales 37 to 48,

average 43; ventrals 33 to 47, average 40.5; scales around body 37 to 48, average 42.7; lateral scales in parallel rows; femoral pores 13 to 20, average 16.1; femoral pore series usually in contact medially; scales on posterior surface of thigh granular; no postfemoral dermal pocket; tibia/head proportion averages 78.7. An indistinct dorsolateral light line on each side; between these, two series of transverse bars; a similar series on sides of body; a black spot on shoulder, with

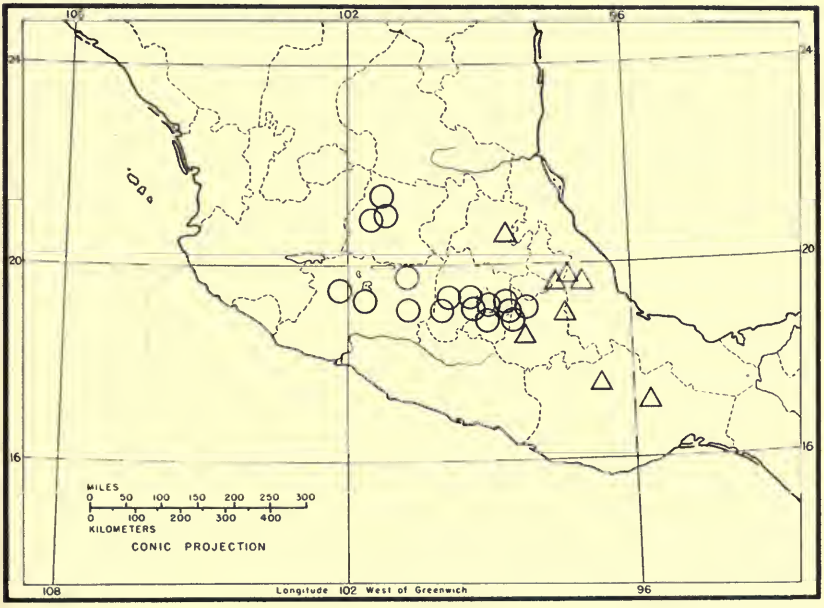

FIG. 57. Distribution of *Sceloporus aeneus aeneus*, ○; and *S. a. bicanthalis*, △.

a small blue spot on its anterior edge; ventral surfaces, especially in gular region, strongly barred in males, indistinctly barred in females; sides of belly, gular region, sides of chest, and ventral surfaces of hind limbs blue (barred with black); a white longitudinal line on infralabial region; two white lines on each side of head usually distinct; a continuous dark line down middle of tail.

Description of type.—Head scales keeled; frontal ridges rather prominent; interparietal subtriangular, about three-fourths size of supraorbital area; two parietals on each side; one frontoparietal on one side, two on other; frontal broadly in contact with interparietal; supraoculars small, four on each side, separated from median head scales by a row of relatively large scales; one complete and two

incomplete rows of smaller scales between supraoculars and superciliaries; six superciliaries on each side, five visible from above; prefrontals widely separated by a large azygous scale; frontonasals subequal in size, the median scale separated from lateral frontonasal on one side; three pairs of internasals, the scales decreasing in size anteriorly, the posterior pair in contact with frontonasals; two postrostrals; nasal elongate, nostril pierced in extreme posterior part; two canthals on each side, typical in position and relationships with each other and other scales; subnasal present; a single loreal on each side; preocular divided; two complete rows of lorilabials; three or four postoculars; three supralabials and four or five infralabials to a point below middle of eye.

Mental pentagonal, with a labial border about one-half that of rostral, with a rounded notch on each side at point of contact with infralabials; three or four postmentals on each side, the anterior scale of either side in contact with its fellow; outer row of labiomentals terminating anteriorly below anterior part of second infralabial; inner row of labiomentals practically obsolete; gular scales smooth, all with an apical notch except extreme anterior scales; anterior gular scales somewhat smaller than other gulars.

Auricular lobules very short, smaller than preceding scales, four in number; temporal scales keeled, not or very weakly mucronate, smaller than largest scales between ear and lateral nuchal pocket; scales in axilla and immediately above arm granular; scales between arm and nuchal pocket subequal in size to temporal scales, keeled, mucronate, denticulate, their keels parallel with body axis; scales behind upper edge of nuchal pocket smaller (sometimes very small, nearly granular), increasing in size dorsally.

Dorsal scales 42 from occiput to base of tail; keeled, mucronate, denticulate, in parallel rows, 10 rows at rump, 11 at nape; scales around body 41; lateral scales keeled, mucronate, denticulate, in parallel rows (except in groin and above arm), somewhat smaller than dorsal scales, subequal in size to ventral scales; 40 ventral scales from a line across shoulder to anus; ventral scales smooth, notched, those in preanal region somewhat smaller than abdominals.

Dorsal scales of foreleg subequal in size, about three-fifths size of dorsals on body, keeled, mucronate, denticulate; ventral scales of lower foreleg keeled, denticulate, about two-thirds size of dorsal scales of same member; scales on anterior surface of lower foreleg smooth; ventral scales of upper foreleg smooth, the median scales

much smaller than ventrals on lower foreleg; lamellar formula for fingers 6–9–15–17–9 (6–10–16–16–10).

Dorsal scales of hind leg keeled, mucronate, denticulate, about two-thirds size of dorsal scales on body; scales on anterior and ventral surfaces of thigh smooth, becoming somewhat smaller toward femoral pores; femoral pores 17–18, the series in contact medially; scales on posterior surface of thigh granular; ventral scales of shank smooth, pointed, sometimes with an apical notch, subequal in size to dorsal scales of same member; scales at ankle very small; lamellar formula for toes 7–10–14–19–12 (7–11–16–20–13).

Dorsal scales on tail strongly keeled, strongly mucronate, not or weakly denticulate, slightly larger than dorsal scales on body; subcaudals smooth, notched near base of tail, becoming keeled, mucronate and denticulate toward tip of tail; enlarged postanals present; (females with caudal and preanal scales as in males); no postfemoral dermal pocket.

Coloration.—General dorsal ground color sorghum brown to Vandyke brown; a narrow dorsolateral line, white or lighter brown, extending from posterior corner of orbit onto base of tail, becoming wider past rump; this line frequently prolonged through orbit, below canthus and to tip of snout; another white line extending from tip of snout, passing through supralabial region, to middle of anterior edge of ear opening; a diagonal, white line from posterior corner of orbit to upper anterior edge of ear opening (sometimes absent); a narrow lateral white line on body, extending from near upper posterior edge of ear opening to groin; this line occasionally broken; a white line passing from mental through infralabial region, below ear, to lower edge of lateral pocket (sometimes absent); between dorsolateral light lines, two series, one on each side, of eleven or twelve irregularly outlined dark-colored bars; these bars frequently with a faint light posterior border; between dorsolateral and lateral light lines, a series of five to nine similar bars (sometimes absent, frequently very faint); the light posterior border of these bars frequently reduced to a small white spot; limbs with narrow dark bands; a dark bar passing across anterior part of supraorbital area and anterior section of frontal frequently obsolete on frontal; a triangular black spot in front of shoulder, with a pale blue spot on its anterior and posterior borders; a narrow dark-brown stripe down middle of tail; posterior surface of thigh gray-brown, sometimes with a narrow median longitudinal dark stripe, bordered above and below by a lighter stripe.

Sides of belly cerulean blue to light methyl blue; remainder of lighter areas of ventral surface white; gular area with very distinct irregular broad black bars, tending in general to converge posteriorly; chest and entire ventral and lateral surfaces of abdomen with irregular black streaks, generally longitudinal; middle of abdomen seldom entirely black; ventral surfaces of limbs and base of tail suffused with black.

Females essentially similar to males in dorsal coloration, but the light longitudinal lines frequently light brown instead of white. Occasionally the entire dorsal surface is brownish, with only the dorsolateral light lines faintly marked. Ventral surfaces whitish, usually immaculate save in gular region, which is sometimes suffused with gray or has dark bars converging posteriorly. In occasional females the entire ventral surface of body, limbs, and tail is faintly suffused with gray.

No males have been observed with the complete loss of dorsal markings which occurs in females.

Variation.—The variation in cephalic scutellation of 118 specimens is as follows. Parietals one to three (1, three; 2, one hundred and eighty-nine; 3, three); frontoparietals one or two (1, one hundred and seventy-one; 2, twenty-five); frontal separated from interparietal by an azygous scale in one specimen, in contact with interparietal in 97; posterior section of frontal transversely divided in one, anterior section similarly divided in one; one specimen with five superciliaries on one side, others with six; supraoculars three to six (3, forty-seven; 4, one hundred and nineteen; 5, twenty-five; 6, two); one or more supraoculars in contact with median head scales in 27 specimens; prefrontals in contact medially in 55, separated by contact of frontal and median frontonasal in three, by an azygous scale in 40; median frontonasal broken into two or more scales in seven, separated from lateral frontonasals on both sides in seven, on one side in 14; one pair of internasals in one, two pairs in 40, three pairs in 22, irregular in 35; canthals one–one in one (obviously the first canthals fused with subnasal), one–two in three, two–two in 94; first canthal forced above canthal ridge by contact of second canthal and subnasal on one side in 21, on both sides in 36; loreals one to three (1, one hundred and sixty-five; 2, twenty-five; 3, five) (loreal fused with preocular on one side in one); preocular entire on both sides in 10, on one side in one, partly divided in 12, divided on both sides in 94; three postrostrals in one specimen, others with two; two complete rows of lorilabials below subocular on one side in none, on both sides

in 18; rows incomplete below subocular (interrupted by one or more scales contacting both subocular and supralabials) in other specimens.

Dorsals 37 to 48, average 43 (88 specimens: 37, one; 38, three; 39, four; 40, eleven; 41, fifteen; 42, twenty-three; 43, fifteen; 44, three; 45, seven; 46, four; 47, one; 48, one); ventrals 33 to 47, average 40.5 (86 specimens: 33, one; 35, two; 36, two; 37, four; 38, eleven; 39, thirteen; 40, eleven; 41, fourteen; 42, thirteen; 43, four; 44, five; 45, three; 46, two; 47, two); scales around body 37 to 48, average 42.7 (86 specimens: 37, one; 38, one; 39, three; 40, ten; 41, sixteen; 42, ten; 43, seventeen; 44, eight; 45, ten; 46, three; 47, six; 48, one). Femoral pores 13 to 20, average 16.1 (165 counts: 13, four; 14, eleven; 15, thirty-five; 16, fifty; 17, forty-three; 18, thirteen; 19, eight; 20, one). Scales between femoral pore series none to three (0, fifty-eight; 1, twenty-one; 2, six; 3, one).

Habits and habitat.—At Cruz Blanca, Vera Cruz, specimens were found in stump-holes filled with fallen pine needles. Gadow (1905) states that specimens were found up to 13,500 feet on Mount Orizaba.

Locality records.[1]—OAXACA: Mt. Zempoaltepec (USNM 47604); Reyes (USNM 47395). PUEBLA: Mt. Popocatepetl (USNM 47280); 15 mi. E of San Marcos (EHT 7454–5); (?)Izucar de Matamoros (Tlapanalá) (Cope, 1885). VERA CRUZ: (ANSP 12564); Mt. Orizaba (MCZ 14156; USNM 39917; FMNH 1524 [12]); Jalapa (ANSP 12485); Cofre Perote, to 11,000 ft., near Cruz Blanca (EHT 7917–39); Cruz Blanca (EHT 7940, 7940A, 7456–61); near Totalco (EHT 7462); near Las Vigas (EHT 7942). HIDALGO: Velasco (MCZ 17101; UMMZ 71440 [40], 71438 [2], 71452, 56486); Zacualtipan (ANSP 14731–2); Guerrero Mill (UMMZ 67651); San Miguel (UMMZ 66822).

THE PYROCEPHALUS GROUP[2]

The *pyrocephalus* group consists of three species (*nelsoni, pyrocephalus, gadoviae*) related to each other and distinguished from other *Sceloporus* by having a compressed tail. This character is essentially sexually dimorphic, as the tail is only slightly compressed

[1] One specimen at the University of Michigan purports to be from Matagalpa, Nicaragua, collected by W. B. Richardson, May 6, 1893 (No. 71444). I assume that these data are incorrect. Werner's report of *aeneus* from Honduras (1896), I also believe to be erroneous.

Typical specimens of *aeneus aeneus* (MCZ 16067–72) and *aeneus bicanthalis* (USNM 47280), are from Mount Popocatepetl. It is possible that they came from opposite sides of the mountain.

[2] Approximately 527 specimens examined.

in females. The group is compact in distribution, occupying an area on the western slopes of Mexico from Oaxaca to southern Sonora and southwestern Chihuahua. *S. nelsoni* occurs in the north and is replaced in Jalisco by *pyrocephalus*, which extends southward into Guerrero. In Michoacán *gadoviae* reaches its northernmost limit, ranging southward to the southern limit of distribution of the group.

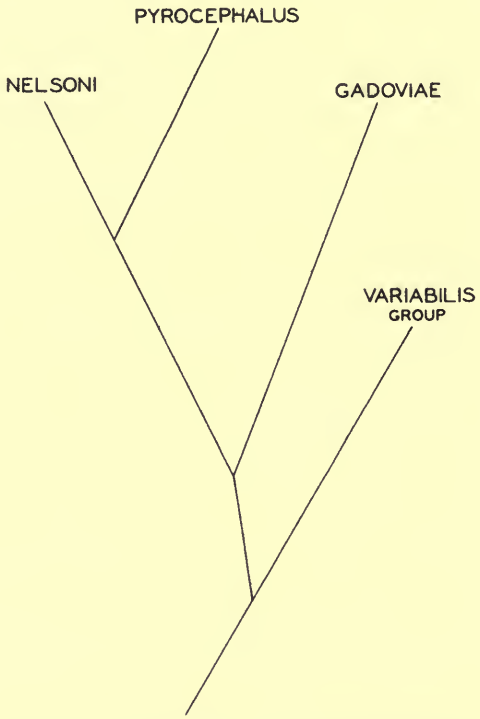

FIG. 58. Phylogeny of the *pyrocephalus* group.

S. nelsoni and *pyrocephalus* are closely allied. *S. gadoviae* differs widely from other members of the group in having very small dorsal scales, a large number of femoral pores, a postfemoral dermal pocket, very small scales on posterior surface of thighs, and many other minor characters.

There are obvious geographic trends in the group. The dorsal scales of *nelsoni* are the largest, *pyrocephalus* is intermediate, and *gadoviae* shows the opposite extreme in small scales. In degree of compression of the tail, *nelsoni* is least modified, while *gadoviae* shows the opposite extreme, with *pyrocephalus* intermediate. In

femoral pore averages, *pyrocephalus* has the lowest, and *gadoviae* the highest.

S. nelsoni is the smallest species, while *pyrocephalus* and *gadoviae* have approximately equal maximum snout-vent measurements; *gadoviae* seems to be the largest.

In habits *gadoviae* seems to be the most secretive; *pyrocephalus* is abundant within its normal range and easily approached; observations on *nelsoni* have been few, but I believe it to be much like *pyrocephalus*.

The origin of the group is obscure. *S. gadoviae* shows affinities to the *variabilis* group in its postfemoral dermal pocket, small scales on the posterior surface of thighs, and small dorsal scales, but that *gadoviae* could give rise directly to the other forms is hardly likely, on account of the high degree of specialization of its tail. That the group is a natural one is more or less assured by its compact range and by the common character of the compressed tail, which is otherwise unknown in the genus. I assume *gadoviae* to be nearest the primitive type, as it retains certain characters of the *variabilis* group, from which I believe it was derived. Early in its evolution, *pyrocephalus* and *nelsoni* may have diverged from this stem. The assumption that *gadoviae* is a remnant of a primitive stock is supported by its secretive habits and its restriction to a somewhat arid region. That the group as a whole is relatively old is indicated by the small number of species that are included and by their relative stability.

Characters or general tendencies held in common by the species of the group, in addition to the compressed tail, are: postanal scales greatly reduced in size or absent in males; oviparity; supraoculars entire; frontal normal, with a single division; sides of belly lavender in males; gular region similarly barred in males of all species; scales on sides of body in diagonal rows; and head scales smooth.

KEY TO SPECIES OF THE PYROCEPHALUS GROUP

1.—Scales on posterior surface of thigh granular; postfemoral dermal pocket present ..... *gadoviae* (p. 373)

Scales on posterior surface of thigh larger, imbricate; no postfemoral dermal pocket 2

2.—Dorsal scales larger, 36 to 41; females not red-headed; males with unbroken lateral belly patches; dark spot on interparietal not enclosing or touching light pineal spot ..... *nelsoni* (p. 364)

Dorsal scales smaller, 41 to 50; females red-headed, conspicuously barred below on throat; males (and usually females) with a series of broad dark bars on each side of belly; a dark spot surrounding light pineal spot. *pyrocephalus* (p. 361)

Sceloporus nelsoni Cochran.

Sceloporus pyrrhocephalus Van Denburgh, Proc. Acad. Nat. Sci. Phila., **1897**, p. 463, 1898.

Sceloporus nelsoni Cochran, Jour. Wash. Acad. Sci., **13**, pp. 185–186, 1923; Taylor, Univ. Kans. Sci. Bull., **24**, pp. 507, 518–519, 1938.

Type locality.—Plomosas, Sinaloa. Type USNM 47676.

Distribution.—Pacific slopes northward from northwestern Jalisco to southern Sonora and southwestern Chihuahua (fig. 59).

Diagnosis.—A *Sceloporus* of moderate size, maximum snout-vent measurement 62 mm.; tail compressed in males; tail in females slightly compressed; no enlarged postanals in males; a single parietal on either side; preocular rarely entire; dorsals 35 to 41 from occiput to base of tail, average 37.2; dark spot on interparietal not enclosing or touching pineal light spot; scales on posterior surface of thigh slightly smaller than preanal scales. In males sides of belly lavender, with a broad, median, dark blue border; females uniform white below.

Description.—Dorsal head scales smooth, with large pits, the median scales convex; frontal ridges prominent, involving frontal and prefrontals; interparietal pentagonal, about two-thirds size of supraorbital area; a single parietal on each side (the scale posterior to parietal sometimes slightly enlarged); frontoparietals one or two on each side, occasionally in contact medially; frontal usually in contact with interparietal; anterior section of frontal twice or three times size of posterior section; supraoculars five, one or more in contact with median head scales, others separated from median head scales by a single row of small scales; supraoculars separated from superciliaries by one complete and another incomplete row of small scales; five or six superciliaries visible from above; prefrontals usually in contact medially; lateral frontonasals five-eighths to two-thirds size of median frontonasal; lateral frontonasals in contact with both canthals; a pair of large internasals preceding frontonasals sometimes in contact with first canthal; postrostrals usually two; subnasal absent; first canthal nearly twice size of second canthal; loreal single; preocular usually divided; subocular long, keeled; two postoculars; usually two complete rows of lorilabials, occasionally one, or one complete and another incomplete row; three and one-half supralabials and four infralabials to a point below middle of eye.

Mental pentagonal, with a labial border less than one-half that of rostral; three to five postmentals on each side; the anterior postmental in each row in contact with its fellow on median ventral line; first pair of postmentals usually much larger than others; outer row

of labiomentals terminating anteriorly between posterior parts of first postmental and first infralabial; outer row of labiomentals terminating anteriorly between second and third infralabials; gular scales notched (except anterior gular scales), smooth; anterior gular scales smaller than median posterior gular scales; the latter, in turn, smaller than lateral gular scales.

Auricular lobules very small, five or six in number, smooth, rounded, smaller than preceding scales; temporal scales keeled, not mucronate, slightly more than one-half size of scales above lateral nuchal pocket; latter scales one-third to one-half larger than scales between arm and nuchal pocket; latter extremely deep.

Dorsal scales keeled, strongly mucronate, denticulate, in convergent (sometimes nearly parallel) rows; dorsals merging gradually with lateral scales; lateral scales similar in character to dorsal scales, about one-half size of largest dorsals; median ventral scales somewhat smaller than lateral scales; scales on chest somewhat larger than median scales on belly, twice or three times size of preanal and interfemoral scales; all ventral scales, except preanals, notched.

Dorsal scales of foreleg keeled, mucronate, denticulate, those on upper foreleg about one-half size of dorsals on body, those on lower foreleg somewhat smaller; scales at elbow reduced in size; ventral scales of lower foreleg somewhat smaller than dorsal scales of same member, scales on anterior and anteroventral surfaces of lower foreleg smooth, mucronate; posteroventral scales keeled, mucronate, denticulate; ventral scales of upper foreleg smooth, notched, one-fourth to one-third size of ventrals on lower foreleg; lamellar formula for fingers 6–10–13–13–10 (7–10–13–13–10).

Dorsal scales of hind leg keeled, mucronate, denticulate, those on shank about two-thirds size of dorsals on body, those on thigh somewhat smaller; scales on anterior and ventral surfaces of thigh smooth, notched, decreasing in size toward series of femoral pores; scales on posterior surface of thigh keeled, mucronate, denticulate, subequal in size to or somewhat smaller than preanal scales; scales on ventral and posterior surfaces of shank somewhat smaller than dorsals of same member, smooth, notched; lamellar formula for toes 7–10–14–17–13.

Dorsal and lateral scales at base of tail somewhat larger than scales on back, mucronate, denticulate, the scales of the two dorsal rows strongly keeled; subcaudals smooth, mucronate, becoming keeled toward tip of tail; subcaudals at base of tail in females strongly

mucronate, denticulate, very weakly keeled; no enlarged postanals in males; postfemoral pocket absent.

Coloration.—Dorsal coloration of body much like that of *pyrocephalus*. General ground color light brown; a lateral dark band extending from shoulder to hind leg, bordered above by a faint narrower light band; labial region with broad bars of brown separated by narrow light bars; a dark spot in front of insertion of foreleg, extending dorsally to lateral dark band, and passing a short distance onto chest, becoming less distinct ventrally; anterior surfaces of limbs with white, rounded spots, those on hind limbs separated from each other by dark brown to black blotches, the color darker proximally; dorsal surfaces of limbs with light and dark, brown bands, more distinct on forelegs; tail with broad, indistinct, dark bands; a black spot on posterior medial edge of interparietal, bounded on either side by a narrow white spot, on the lateral edges of which sometimes occurs a dark area; pineal spot light, but not startlingly white as in *pyrocephalus*. Lower labials barred like upper labial region, but less distinctly; lateral gular region tinged with lavender; anterior gular area suffused with pale blue; central gular area with scattered white or light-colored spots; sides of belly lavender, this color bordered medially by a broad dark blue band, which extends into groin; blue borders frequently confluent medially, originating anteriorly at a point approximately opposite axilla; ventral surfaces of hind legs suffused with gray brown; subcaudal surface white.

Females similar to males above, but the markings much less distinct; a series of very narrow undulate crossbars on back; labial region with very dark brown bars; ventral surfaces entirely immaculate (Mazatlán specimens).

Variation.—The variation in scutellation of the head, as recorded for 41 specimens, follows: a single parietal in all; frontoparietal divided on both sides in 16, on one side in nine; frontoparietals in contact medially in six, separated by an azygous scale in one, by contact of frontal and interparietal in 34; fourth and fifth supraoculars in contact with median head scales in 37 counts (of 77), fifth only in two, fourth only in 14, third and fourth in one, third only in 12, three supraoculars contact in one, and in only 10 counts are the supraoculars completely separated from median head scales; supraoculars separated from superciliaries by one row of scales in one specimen, by one complete and another incomplete row on 18 (of 19 counted); preocular entire in four, divided in 37; lorilabials reduced

to one row below subocular on both sides in nine specimens, on one side in 13; four postrostrals in five specimens, three in 11, two in three (19 counted); nasal contacts rostral in one; scales of first pair of postmentals separated medially by an azygous scale in one.

Dorsal scales 35 to 41, average 37.2 (30 counts: 35, six; 36, six; 37, seven; 38, four; 39, two; 40, four; 41, one); ventrals 37 to 53, average 46.7 (31 counts: 37, one; 41, one; 42, one; 43, two; 45, two; 46, six; 47, four; 48, five; 49, four; 50, four; 53, one); scales around body 36 to 46, average 40 (28 counts: 36, four; 37, one; 38, five; 39, four; 40, three; 41, one; 42, seven; 44, two; 46, one). Femoral pores 14 to 20, average 16.9 (57 counts: 14, two; 15, three; 16, fourteen; 17, twenty; 18, sixteen; 19, one; 20, one).

As pointed out by Cochran (1923), specimens from the region about Mazatlán are generally lighter in color. Females from this locality have much less ventral maculation on the throat, breast, and sides of abdomen, than females from elsewhere, and males have less maculation on the chest. It appears, however, that the differences are not sufficient to establish a race.

Comparisons.—From its closest relative, *pyrocephalus*, *nelsoni* differs in a number of characters. These differences are in dorsal scale count (36 to 41, *nelsoni;* 41 to 50, *pyrocephalus*); ventral scale counts (37 to 53, *nelsoni;* 50 to 60, *pyrocephalus*); average femoral pore count (16.9, *nelsoni;* 14, *pyrocephalus*); frontoparietals (very frequently divided in *nelsoni*, never in *pyrocephalus*); parietals (one, *nelsoni;* two, *pyrocephalus*); supraoculars (rarely all separated from median head scales in *nelsoni*, rarely any in contact in *pyrocephalus*); preoculars (rarely entire in *nelsoni*, rarely divided in *pyrocephalus*). The color differences in males (ventral surface) are striking. Females of *nelsoni* have only a slight tinge of pink on the head, or none, while the females of *pyrocephalus* have strikingly reddish heads; females of *nelsoni* seem usually to be less maculate below.

Habits and habitat.—At Cinco Minas, specimens were found running about in leaves in rocky areas of an oak woods, in a highly mountainous region. The stomach of a single specimen examined contained a small grasshopper, and what appeared to be the remains of a spider.

Locality records.—CHIHUAHUA: Guazaremo, Rio Mayo (MCZ 1). SONORA: Guirocoba, 30 mi. SE of Alamos (MCZ 37855). SINALOA: near Mazatlán (EHT 8684A–E; MCZ 32596); Rosario (UMMZ 58534); Plomosas (USNM 47676); Culiacán (Cochran, 1923); S of Rincón de Urias (AMNH 20693–20713). NAYARIT: near Tepic

(EHT 9873–81). JALISCO: Barranca Ibarra (Cochran, 1923); near Cinco Minas (EHT 7683–4); near Magdalena (EHT 7680–2); near Las Viboras Mine, Hostotipaquillo (AMNH 15517); Paso de Guamuchil, below Hostotipaquillo (AMNH 18470); W of Hostotipaquillo (AMNH 18471).

Sceloporus pyrocephalus Cope.[1]

Sceloporus pyrocephalus Cope, Proc. Acad. Nat. Sci. Phila., **1864**, p. 177, 1864; Sumichrast, Bibl. Univ. Rev. Suisse, **46**, p. 243, 1873; Cochran, Jour. Wash. Acad. Sci., **13**, p. 186, 1923.

Sceloporus pyrrhocephalus Cope, Proc. Amer. Phil. Soc., **22**, pp. 394, 397, 1885; Boulenger, Cat. Liz. Brit. Mus., **2**, pp. 218, 235, 1885; Cope, Bull. U. S. Nat. Mus., **32**, p. 36, 1887; Günther, Biol. Cent-Amer., Rept. Batr., p. 70, 1890; Boulenger, Proc. Zool. Soc. Lond., **1890**, p. 78, 1890; Dugès, Naturaleza, (2), **2**, p. 479, 1896; Cope, Amer. Nat., **30**, p. 1024, 1896; Boulenger, Proc. Zool. Soc. Lond., **1897**, pp. 477, 512–513, 1897; Cope, Ann. Rept. U. S. Nat. Mus., **1898**, pp. 336, 338, 343, 1900; Gadow, Proc. Zool. Soc. Lond., **2**, p. 194, 1905; Boulenger, Proc. Zool. Soc. Lond., **2**, p. 247, 1905; Gadow, Zool. Jahr., Syst., **29**, p. 706, 1910; Barbour and Loveridge, Bull. Mus. Comp. Zool., **69**, p. 335, 1929; Gadow, Jorullo, pp. 55, 57, 1930; Oliver, Occ. Papers Mus. Zool. Univ. Mich., **360**, pp. 11–12, 1937.[2]

Type locality.—Near Colima, Mexico. Type USNM 31495, collected by John Xantus.

Distribution.—Central Jalisco, southeastward to central Guerrero, on the western escarpment of the plateau (fig. 59).

Diagnosis.—A species of *Sceloporus* of moderate size, maximum snout-vent measurement about 72 mm.; tail strongly compressed in males, slightly compressed in females; scales on posterior surface of thigh and preanal scales subequal in size; no enlarged postanals in males; no postfemoral dermal pocket; a dark spot surrounding or nearly surrounding pineal eye; dorsal scales 41 to 50; two parietals on each side; preocular divided; frontal in contact with interparietal; males with a distinct ventral pattern of six or seven dark blue bars across middle of abdomen, the bars usually broken medially; ventral surfaces of females similar, bars less distinct; gular and labial region of females with distinct black bars; head of females brownish-red.

[1] The original spelling was *pyrocephalus* (fire-headed). The change to *pyrrhocephalus* changes the meaning to red-headed, employing a different word. Since Cope did not explain why *pyrocephalus* should be changed, and since either spelling is grammatically correct and applicable in meaning to this species, I believe it proper to retain *pyrocephalus*.

[2] *S. pyrrhocephalus* Van Denburgh (Proc. Acad. Nat. Sci. Phila., **1897**, p. 463, 1898) is referable, I believe, to *S. nelsoni*.

Description.—Head scales smooth, somewhat convex; a pair of weakly developed frontal ridges; interparietal subtriangular, about two-thirds size of supraorbital area; two parietals on each side; frontoparietals single on each side; frontal rarely separated from interparietal; posterior section of frontal one-half to one-fourth size of anterior section; supraoculars five, separated from median head scales by a complete row of small scales (occasionally incomplete);

FIG. 59. Distribution of *Sceloporus nelsoni*, △; and *S. pyrocephalus*, ○.

a complete or incomplete row of small scales between supraoculars and superciliaries; five superciliaries visible from above; prefrontals in contact medially, or separated by contact of frontal and median frontonasal; lateral frontonasals somewhat smaller than median frontonasal, in contact laterally with both canthals; subnasal very rarely present; a pair of large internasals immediately preceding frontonasals; a pair of very small internasals immediately behind rostral; postrostrals two, separated medially by anterior pair of internasals; two canthals, the second about two-thirds size of first; usually a single loreal, occasionally absent; preocular rarely divided;

lorilabials one or, occasionally, two rows; subocular long, keeled; two postoculars; three and one-half supralabials and four infralabials to a point below middle of eye.

Mental pentagonal, with a labial border about one-half that of rostral; from three to five pairs of postmentals, the scales of the anterior pair more than twice size of mental and in contact medially; gular scales smooth, rounded, notched (anterior gular scales not notched); median gular scales somewhat smaller than lateral gulars.

Auricular lobules very small, four or five on each side, smaller than preceding scales; temporal scales weakly keeled, not or weakly mucronate, about equal in size to scales in a small area behind ear; scales immediately in front of lateral nuchal pocket strongly mucronate, denticulate, somewhat larger than scales between lateral nuchal pocket and arm.

Dorsal scales keeled, mucronate, denticulate, in convergent rows, not well differentiated from lateral scales; lateral scales about two-thirds size of dorsal scales, more strongly denticulate; median ventral scales about three-fourths size of lateral scales; scales of chest somewhat larger than scales on middle of belly, subequal in size to anterior preanal scales; posterior preanal scales reduced in size; all ventral scales notched (except posterior preanals), smooth.

Dorsal scales of foreleg keeled, mucronate, denticulate, about one-third size of dorsals on body; dorsals of lower foreleg somewhat smaller than dorsals of upper foreleg; scales at elbow reduced in size; ventral scales of lower foreleg about two-thirds size of dorsals of same member; scales on anterior and anteroventral surfaces of lower foreleg smooth, rounded or notched; scales on posteroventral surface of lower foreleg keeled, mucronate, denticulate; scales on ventral surface of upper foreleg smooth, notched, about one-fourth size of ventrals of lower foreleg; lamellar formula for fingers 7–11–13–15–11 (7–12–13–14–11).

Dorsal scales of hind leg keeled, mucronate, denticulate, about one-half size of largest dorsals on body, those on shank averaging larger than those on thigh; scales on anterior and ventral surfaces of thigh smooth, notched, decreasing in size toward series of femoral pores; scales on posterior surface of thigh keeled, mucronate, subequal in size to, or slightly smaller than, largest preanal scales; ventral scales of shank somewhat smaller than dorsals of same member; scales on posterior, posteroventral, and median ventral surfaces of shank smooth, notched; lamellar formula for toes 7–11–15–17–13 (7–12–16–19–14).

Dorsal and lateral scales of tail strongly mucronate, denticulate, the two dorsal rows strongly keeled; basal caudals (dorsal and lateral) about one and two-thirds times as large as dorsals on body; subcaudals smooth, becoming keeled toward tip of tail, notched; basal subcaudals in females strongly mucronate, sometimes very weakly keeled; enlarged postanals absent in males; no postfemoral dermal pocket.

Coloration.[1]—General dorsal ground color in males bay; each scale row with a very broad median greenish-blue band, variable in distinctness; a lateral black or dark brown band extending from temporal region above ear to hind leg, becoming very broad on sides of abdomen; lateral dark band narrow between ear and shoulder (but becoming gradually wider) and frequently obsolete anterior to ear; an indistinct light line above and below lateral line; head light brown; a white pineal spot, usually completely surrounded by a single small oval black spot, the latter black spot occasionally extending only to pineal spot, and a less distinct dark area in front of pineal spot; occasionally a short light band on either side of dark spot, originating at posterior edge of interparietal, bordered laterally by a small black spot at posterior edge of interparietal; limbs with alternate light and dark brown bands, those on hind leg indistinct, those on foreleg very distinct; tail with a hue of metallic blue in life, much more distinct than the blue color on back. Labial and gular regions with bands of yellow and light blue; a large, black or dark brown spot in front of arm, extending dorsally to lateral dark line, and extending a short distance onto chest; chest with a few irregular splotches of dark blue; sides of belly lavender, lateral edges of scales light brown; two series of six or seven broad, dark blue bars on abdomen, separated from each other by narrower light-blue intervals (except in middle of abdomen); a narrow white line down middle of abdomen, sometimes complete, sometimes broken by the dark-blue transverse bands; ventral surfaces of hind legs bluish-white; subcaudal surface purple to lavender.

Dorsal surfaces in females dark olive to olive-gray; an indistinct lateral dark stripe, sometimes partially broken, bordered above by a greenish-olive light streak, and below by a very indistinct streak of similar color; head brownish-red; labial region banded with orange and black; dorsal surfaces of limbs with narrow bands, brownish and faint on hind legs, more distinct on forelegs; a narrow black bar in

[1] Parts of these color descriptions have been taken from the field notes on specimens collected in Colima, Mexico, by James A. Oliver.

front of arm, passing dorsally to or beyond the dorsolateral light line, and ventrally a short distance on breast; the succeeding dark band on upper foreleg darker than those which follow; dorsum with numerous, narrow, interrupted brownish bars or spots forming a dorsolateral row on each side; tail with indistinct, angular or broken, narrow bands, each with a posterior light border; ventral surfaces tinged with orange, brighter on hind legs; throat reddish-orange, traversed by six pairs of very distinct, convergent, dark blue lines; six or seven dark blue bands across abdomen, sometimes absent; ventral surface of tail olive, the color extending onto preanal region. In life the females are very conspicuous by their red heads.

Variation.—The variation in the scutellation of the head in 40 specimens is as follows: two parietals in all specimens; frontal and interparietal separated by an azygous scale in two, in contact in 38; frontoparietals single on each side in all; frontal entire in one; supraoculars partially in contact with median head scales on one side in four; scales between supraoculars and superciliaries in one row in 31, an incomplete row added in nine; prefrontals in contact medially in 20, separated by an azygous scale in one, and separated by contact of frontal and median frontonasal in 19; subnasal present in one; preocular divided in four; two complete rows of lorilabials on both sides in eight, on one side in eight; outer row of labiomentals terminating usually below suture between first and second infralabials; inner row of labiomentals usually terminating below suture between second and third infralabials; second pair of postmentals with the scales in contact medially in one, separated by two, rarely three or four, small scales in the others.

Habits and habitat.—The courtship behavior of this species is described by Oliver (1937, pp. 11–12).

Females collected July 5 and 21, 1935, contain eggs varying in number from five to seven. Several stomachs examined contained beetles, bugs, cockroaches, spiders, a few insect larvae, and termites. One stomach examined contained a huge number of termites, and one or two beetles.

Locality records.—JALISCO: Guadalajara (USNM 24927–35). COLIMA: Hda. Paso del Rio (EHT 7967–78; UMMZ 80100 [2], 80101); Manzanillo (EHT 7955–66; AMNH 15723; LAM 539 [2], 538 [2], 541 [2], and 5 with no number); Colima (USNM 31427–32, 31434–54, 31456–65, 31495; MCZ 17552–3; AMNH 15922–34, 15896–9, 12758–60, 12764; LAM 540); 2 mi. E of Colima (AMNH 12753); 2 mi. S of Colima (AMNH 12748); Hda. de los Limones

(USNM 24936); Volcan Colima (FMNH 1670); 5 mi. NW of Villa Alvarez (UMMZ 80095 [7], 80097 [29], 80096 [4]); 4 mi. W of Villa Alvarez (UMMZ 80094 [6]); 2–3 km. NW of Villa Alvarez (UMMZ 80102); Salvador (UMMZ 80098 [2]; AMNH 15529–30); Rio Salada, SE of Hda. Las Ortices (UMMZ 80099 [3]); Arroyo de la Estancia (AMNH 12757); Estancia (AMNH 15528); Laguna de Cuyutlan, Manzanillo (LAM 542 [6]). MICHOACÁN: Hda. El Sabino (EHT 7979–8093, 8105–37); La Salada (USNM 47740–4, 47789); Jorullo (Gadow, 1930, pp. 55, 57). GUERRERO: S of Taxco (EHT 8094); km. 240, N of Balsas (EHT 8094A, 8095–8104); 2 mi. N of Agua, Bendita (EHT 7946–54); Rio Balsas (USNM 47924–7); Balsas (FMNH 1009 [8]); Iguala (Gadow, 1905, p. 194).

Sceloporus gadoviae Boulenger.

Sceloporus gadoviae Gadow, Proc. Zool. Soc. Lond., 2, p. 195, 1905 (nomen nudum); Boulenger, Proc. Zool. Soc. Lond., 2, pp. 246–247, pl. 7, fig. 1, 1905; Gadow, Jorullo, pp. 55, 65, 1930.

Sceloporus gadowi Gadow, Through Southern Mexico, p. 479, 1908.

Type locality.—Mezquititlan, north of Chilpancingo, Guerrero. Type in British Museum.

Distribution.—Southern Michoacán, through Guerrero and Morelos, southern Puebla, to northern and western Oaxaca (fig. 53).

Diagnosis.—A *Sceloporus* of moderate size, maximum snout-vent length 68 mm.; tail strongly compressed in males, not or slightly compressed in females; postfemoral dermal pocket present; scales on posterior surface of thighs minute, much smaller than preanal scales; femoral pores 24 to 33 on each side, the two series separated from each other by not more than eight scales; dorsal scales 80 to 96 from occiput to base of tail. Dorsal surfaces more or less uniform olive-brown; a black spot in front of insertion of foreleg posteriorly bordered by a white line extending upward on sides of body; throat with broad light blue bands separated from each other by narrow white lines; tail light pink in females, entirely immaculate distally, becoming gray and maculate near base.

Description.—Head scales smooth, pitted; no frontal ridges; interparietal large, rounded, about one-half to two-thirds size of supraorbital area; two parietals on each side (posterior parietal sometimes split into small scales); usually a single frontoparietal on each side; frontoparietals in contact medially, or separated by contact of frontal and median frontoparietal; posterior section of frontal occasionally transversely divided; anterior section of frontal occa-

sionally longitudinally divided; supraoculars four to seven, separated from median head scales by a single row of small scales, and from superciliaries by two to four irregular rows of scales; six or seven superciliaries visible from above; prefrontals in contact or separated by an azygous scale (usually); internasals variable; postrostrals usually four; subnasal present, slightly smaller than first canthal; latter somewhat smaller than second canthal; loreals one or two; preocular usually divided; subocular long, keeled; postoculars two or three; lorilabials variable, in two rows at least (see variation); three and one-half to four supralabials and five to six and one-half infralabials to a point below middle of eye.

Mental pentagonal, with a labial border slightly more than one-half that of rostral; five or six postmentals on each side, the anterior scale in either series in contact with its fellow; outer row of labiomentals terminating anteriorly between first postmental and first infralabial (sometimes terminating at posterior edge of second postmental); inner row of labiomentals terminating below second or third infralabial; gular scales smooth, with one or two apical notches (except anterior gulars); scales immediately preceding gular fold region somewhat reduced in size; anterior gular scales smaller than lateral gular scales.

Auricular lobules five to seven, very small, mucronate, smooth, the largest larger than preceding scales; temporal scales very small, keeled, about 12 to 15 between third postocular and ear; temporal scales subequal in size to scales between ear and lateral nuchal pocket; a weak fold between middle of nuchal pocket and upper part of ear, surmounted by somewhat enlarged scales; scales above arm and in an elongate area between arm and nuchal pocket granular; a fold passing from upper edge of nuchal pocket obliquely upward and posteriorly, terminating blindly above axilla; below this fold, scales granular, and above the fold, scales larger and imbricate.

Dorsal scales keeled, mucronate, weakly denticulate, in convergent rows, not well differentiated from lateral scales; lateral scales about one-half to two-thirds size of dorsal scales, otherwise similar in character to dorsals; median ventral, lateral, and preanal scales subequal in size; scales on chest larger than those on belly; all ventral scales, including preanals, with one or, rarely, two apical notches.

Dorsal scales of foreleg keeled, strongly mucronate, weakly denticulate, subequal in size to dorsals on body; scales at elbow reduced in size; ventral scales on lower foreleg subequal in size to dorsals of same member, smooth, notched or denticulate; ventral scales of

upper foreleg smooth, denticulate, one-half to two-thirds size of ventrals on lower foreleg; lamellar formula for fingers 8–12–16–15–13 (8–12–15–16–13).

Dorsal scales of hind leg keeled, strongly mucronate, weakly denticulate, somewhat larger than dorsal scales of foreleg; scales on ventrolateral and ventral surfaces of thigh smooth, with one or two apical notches, smaller near femoral pore series; scales on posterior surface of thigh very small, smooth or weakly keeled, mucronate, denticulate, much smaller than preanal scales; scales on ventral surface of shank smooth, with two apical notches, equal in size to dorsal scales of same member; lamellar formula for toes 7–11–16–19–15 (7–11–16–20–14).

Dorsal and lateral scales of tail nearly twice as large as dorsals on body, strongly mucronate, those toward tip of tail denticulate; dorsal caudals more strongly keeled than lateral scales; subcaudals smooth, with usually two apical notches; basal subcaudals in females strongly mucronate, not or very weakly keeled; postanals not or very slightly enlarged in males; postfemoral dermal pocket present.

Coloration.—In males the general dorsal color is Hays brown to fuscous; about ten very indistinct, slightly darker bands across back; bands on limbs somewhat more distinct; tail with similar bands, becoming lighter brown toward tip; larger males with a very dark ventral coloration; gular and inguinal region and a broad median ventral band, marine blue; ventral surfaces of tail and hind limbs somewhat lighter blue; labial region pale blue, banded with darker; sides of abdomen azure blue, sometimes pearl blue and frequently somewhat iridescent. In younger males, chest and ventral surfaces of hind limbs and tail whitish.

General ground color in females is drab to clove-brown, lighter on head; a few indistinct elongate oval blackish spots scattered over back and sides; a few light spots, each about the size of a scale, scattered over back and sides; limbs faintly banded with darker; a few indistinct bars across orbital region sometimes visible; a few, faint, convergent, glaucous blue bands in gular region; upper labial region with white and gray bands; ventral surfaces of body whitish in general; a broad, lateroventral, brick red to pink-colored band passing from near axilla to groin (disappears in material preserved several years); ventral surface of tail sometimes light blue; posterior surfaces of thighs whitish, sometimes irregularly spotted with gray.

Variation.—The variation in the scutellation of the head in 35 specimens is as follows: posterior section of parietal broken into

small scales in six specimens; frontoparietals divided into two on both sides in six, on one side in four; frontoparietals contact medially in 15, separated by an azygous scale in three; frontal contacts interparietal in 17; posterior section of frontal transversely divided in seven; anterior section of frontal longitudinally divided in three; two or three supraoculars narrowly in contact with median head scales in three specimens; two, three, or four irregular rows of small scales between supraoculars and superciliaries; prefrontals contact medially in 19, separated by an azygous scale in 13; median frontonasal contacts frontal in three; two subnasals in one specimen; lorilabials small, reduced to one row below subocular in 13 specimens, never in less than two rows in loreal region, and increased to three rows in 18 specimens, to four rows in four specimens; preocular entire in two specimens; scales of second pair of postmentals separated by three scales in one, by two scales in the remainder.

Males collected in Puebla and Oaxaca differ rather markedly in coloration from most of the other specimens. The whole gular and labial region is very pale blue, never becoming marine blue as in the others; the marine blue band near the middle of the abdomen is narrower and distinctly defined, and the sides of the abdomen are suffused with brownish and reddish as well as blue. The ventral surfaces of the hind limbs and tail are whitish in all. I have been unable to associate this rather striking color variation with any other characters which would define a valid race. Were the color differences well defined, the problem would be simplified. However, there is one specimen from El Sabino, Michoacán, which has a coloration similar to that of the Puebla and Oaxaca specimens, while the others from the same locality are darker and compare well with specimens from Rio Balsas, Guerrero. These, in turn, are intermediate between the two extremes of light and dark coloration, the latter exemplified by specimens from Puente de Ixtla (Morelos) and Acuitlapan (Guerrero) (the type specimens definitely belong to the dark color phase). It seems possible that this variation in coloration is associated in general with the type of habitat, for the Acuitlapan and Puente de Ixtla specimens came from localities where rainfall is plentiful and vegetation more or less abundant; those from Oaxaca and Puebla come from semiarid regions of the Rio Balsas basin. Why the Rio Balsas specimens from Guerrero should be darker than those from Oaxaca is not evident, for rainfall is equally scant in both places. It may be that the color differences are merely periodical variations in response to the breeding season or rainy season. The

rainy season was well under way in Guerrero when the Rio Balsas specimens were collected; floods were frequent. In Oaxaca and Puebla, however, rain had not fallen for some time. The specimens from El Sabino were collected at the end of the rainy season.

Habits and habitat.—The species appears to be confined to canyon regions. All specimens were collected on rock cliffs, sometimes in actual river canyons, at other times on hilltop cliffs. El Sabino is located in a very mountainous region about halfway down the side of the Mexican plateau, and deep canyons and mesas are numerous. Between these are slopes well covered with boulders, on which *pyrocephalus* is very common. Yet *gadoviae* was never encountered in these open slopes, and *pyrocephalus* was rarely found with *gadoviae* on the cliff walls.

The species is very wary; it was necessary to see the specimens some distance away, and to approach them cautiously in order to get within range of shot shells. Old males are especially wary; females may be approached with greater ease. Once startled, the males are wont to disappear without delay into some crack; the females would run a short distance, then stop and wave the bright pink tail to and fro several times. Frequently their final stop would be in front of a crack into which they would escape if further pursued.

A female collected during the latter part of July, at El Sabino, contained four large eggs, measuring between 13.5 and 14.5 mm. in length and about 7.5 mm. in diameter. The stomachs of two specimens examined contained several small bugs, one beetle, several large ants, and various other insects which were not identified.

Locality records.—MICHOACÁN: Hda. El Sabino (EHT 8200–52); Jorullo (Gadow, 1930). GUERRERO: 12 mi. S of Puente de Ixtla, Morelos (EHT 8138–46, 8253–5, 8262); S of Taxco (EHT 8256–9); 20 km. S of Taxco (EHT 8260); km. 280, N of Rio Balsas (EHT 8261); Rio Balsas (EHT 8149–70); Acuitlapan (EHT 8147–8); Tlapa (USNM 47598); Mezquititlan, N of Chilpancingo (Boulenger, 1905); Cacahuamilpa (MVZ 8866). MORELOS: 5 mi. S of Puente de Ixtla (EHT 8171–2). PUEBLA: Zapotitlán (EHT 8173–93). OAXACA: Cuicatlán (EHT 8194–9; USNM 46774, 46839, 47370); near Huajuapam (USNM 46745).

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INDEX

Current names in roman type; synonyms and secondary references in *italic* type; principal page reference and new forms in **bold-face type.** Unless otherwise indicated, all names occur in combination with the generic name *Sceloporus.*

acanthinurus 75
acanthinus 12, 15, 19, 22, 29, 35, 41, 59, 60, 61, 63, 66, 67, 71, **74**, 75, 78
acathhinus 74, 75
acuminatus, Oxybelis 324
aeneus 17, 18, 20, 21, 30, 330, 332, 348, **353**, 355, 357, 361
  bicanthalis 17, 18, 20, 21, 22, 30, 330, 332, 333, 348, 354, 355, **356**, 357, 361
  Tropidolepis 353
albiventris 16, 20, 21, 29, 59, 60, 61, 99, **108**, 110
Ameiva undulata 261
annulatus, merriami 18, 19, 30, 284, 285, 286, **289**, 290
asper 18, 20, 21, 29, 32, 34, 36, **51**, 55
attenuatus, Batrachoseps 155

Batrachoseps attenuatus 155
becki 29
bicanthalis, aeneus 17, 18, 20, 21, 22, 30, 330, 332, 333, 348, 354, 355, **356**, 357, 361
binocularis 18, 21, 30, 210, **216**, 222
biseriatus 12, 19, 29, 173, **174**
boulengeri 18, 20, 21, 29, 59, 62, 82, 106, 120, **128**, 132
bulleri 18, 20, 30, 210, 213, 217, **218**

caeruleopunctatus 13, 17, 21, 29, 59, 61, 88, **94**, 98
caeruleus 18, 19, 30, 211, **232**, 233
Callisaurus 154
carinatus 15, 19, 30, 300, 301, 302, **303**, 308
cautus 17, 19, 21, 22, 29, **173**, 174
chrysostictus 16, 19, 22, 30, 250, 251, 261, 263, 294, **295**, 300, 301, 305, 308, 335
clarkii 18, 19, 21, 29, 59, 62, 70, **118**, 119, 120, 124, 125, 128, 132, 147
Cnemidophorus tessellatus 155
cochranae 300, 305, 306
consobrinus 18, 19, 20, 21, 22, 29, 173, **175**
couchi 18, 19, 21, 30, 119, 236, 237, 238, 239, **240**, 241, 242, 246, 251, 285
cozumelae 16, 22, 30, 236, 237, 239, 240, 241, **246**, 247, 250, 263, 264, 295
Crotaphytus wislizenii 155
cupreus 17, 21, 30, 257, 300, 301, 302, **305**, 306, 308, 325
cyanogenys 14, 18, 21, 22, 30, 209, 211, 219, **221**, 222

delicatissimus 236, 273
digueti 59, 133
dispar 177, 183, 191
disparilis 13, 14, 17, 18, 19, 20, 21, 22, 30, 71, 177, 179, 182, 190, **191**, 192, 195, 196, 197
dugesii 18, 19, 20, 21, 30, 210, 233, **234**

edwardtaylori 16, 21, 24, 29, 59, 60, 61, 67, **78**, 79
elongatus 12, 29, 173

fasciatus 12, 173
ferrariperezi 18, 20, 21, 22, 30, 210, 213, **214**, 215, 230
flagellum frenatus, Masticophis 155
floridanus 59, 60, 111, 147
  spinosus 111, 116
  undulatus 29, 115
formosus 13, 17, 19, 20, 21, 22, 29, 32, **34**, 35, 39, 41, 55
frenatus, Masticophis flagellum 155
fulvus 300, 319, 323

gadoviae 14, 16, 17, 20, 21, 27, 30, 236, 326, 361, 362, 363, **373**, 377
gadowi 373
gaigeae 16, 22, 29, 59, 62, 67, 70, **71**, 74
garmani 29, 173
goldmani 17, 19, 21, 30, 330, 331, 332, 335, **350**, 353
gracilis 12, 30, 176
graciosus 30, 176
grammicus 21, 30, 177, 178, **179**, 181, 182, 183, 184, 192
gratiosus 333
guentheri 59, 75

heterolepis 18, 20, 30, 177, 179, **197**
heterurus 177, 184
horridus 14, 16, 17, 20, 21, 29, 59, 61, 93, **98**, 99, 104, 105, 106, 107
humeralis 313

immucronatus 18, 20, 21, 22, 30, 211, 228, **230**, 231
intermedius 17, 20, 30, 210, 233, **235**
irazuensis 32, 46, 50

jalapae 17, 21, 22, 30, 308, 309, 330, 331, 332, **333**, 334, 335, 352, 353

jarovii 18, 19, 20, 21, 22, 27, 30, 210, **226**, 228

lateralis, Lysoptychus 236, 241, 242,
licki 13, 19, 29, 59, 62, 120, **140**, 144
lineatulus 19, 29, 59, 61, 148, **168**, 170
lineolateralis 18, 20, 30, 210, **225**, 228
lunaei 22, 29, 59, 60, 61, 62, **63**, 66, 67, 70
lundelli 16, 19, 22, 29, 59, 62, **66**, 67, 70, 71, 73, 74
Lysoptychus lateralis 236, 241, 242

maculosus 18, 27, 30, 236, 284, 290, **291**, 292, 308
magister 18, 19, 20, 21, 29, 59, 62, 63, 124, 125, 137, **145**, 147, 148, 153, 164, 167
malachiticus 12, 22, 29, 32, 34, 42, 43, 45, **46**, 50, 60, 66
marmoratus 12, 18, 19, 21, 22, 30, 236, 237, 238, 240, 263, 264, **272**, 273, 277, 338
Masticophis flagellum frenatus 155
megalepidurus 12, 18, 21, 22, 30, 199, 200, **204**, 205
melanogaster 17, 19, 20, 21, 22, 23, 27, 30, 210, 213, **216**
melanorhinus 16, 19, 20, 21, 29, 59, 60, 61, **82**
merriami 30, 284, **285**, 286, 290
microlepidopterus 177, 184
microlepidota, Uta 183
microlepidotus 13, 17, 18, 19, 20, 21, 22, 30, 54, 55, 177, 179, 182, **183**, 185, 190, 192, 194, 197, 199
microlepidus, Tropidolepis 184
microlepis 177, 184
minor 17, 19, 20, 21, 22, 30, 211, 228, **229**, 230
monserratensis 19, 29, 59, 60, 63, 137, 148, **165**, 167, 168, 170, 171, 172
mucronatus 13, 18, 20, 21, 22, 30, 211, **218**, 219

nelsoni 13, 18, 19, 20, 21, 30, 361, 362, 363, **364**, 367, 368, 369

obscurus 32, 51
occidentalis 12, 29, 173
ochoterenae 16, 20, 21, 30, 300, 301, 302, 306, **308**, 309
oligoporus 14, 16, 17, 18, 19, 20, 22, 27, 29, 59, 93, 99, 104, 105, **106**, 108, 110
olivaceus 18, 19, 21, 22, 29, 59, 60, 62, 99, **110**, 112, 115, 116
olloporus 22, 30, 236, 238, 239, 240, 263, 264, 265, 266, 281, **282**, 324
omiltemanus 13, 17, 19, 20, 21, 22, 30, 211, 219, **220**
orcutti 13, 19, 29, 59, 60, 62, 120, **133**, 137, 140, 144
ornatus 18, 19, 30, 210, **231**, 232, 233
Oxybelis acuminatus 324

parvus 13, 17, 21, 30, 236, 237, 238, 239, 242, 246, **251**, 252, 284, 295
pictus 12, 17, 21, 22, 30, 199, **200**, 204
pilsbryi 177, 192, 195
pleurostictus, Tropidolepis 177, 179
plioporus 16, 22, 30, 210, **212**, 213
poinsettii 14, 18, 19, 20, 21, 30, 209, 211, 219, 222, **223**
pyrocephalus 13, 16, 19, 20, 30, 361, 362, 363, 366, 367, **368**, 369, 377
pyrrhocephalus 364 368

rubriventris 177, 184
rufidorsum 19, 29, 59, 63, 133, 137, 148, **161**, 164, 165, 166, 167, 168, 172

salvini 17, 21, 22, 29, 32, 34, 36, 40, 42, 45, **55**
Sator 29
scalaris 17, 20, 21, 22, 30, 330, 332, 333, 335, **338**, 339, 347, 348, 349, 350
Sceloporus **28**, 29, 30 (key to genus)
schmidti 32, 42, 45, 50
scutulatus 13, 18, 21, 30, 236, 237, 239, **255**, 256, 284
serrifer 16, 19, 22, 30, 71, 74, 210, 211, **212**, 213
siniferus 15, 16, 19, 20, 21, 22, 30, 300, 301, 302, 305, 308, **313**, 317, 318, 324, 325
slevini 18, 19, 20, 21, 30, 330, 335, 338, **343**, 344, 347, 348, 349, 350
smaragdinus 12, 13, 15, 19, 22, 29, 32, 34, **41**, 42, 44, 45, 50, 66, 178, 179
smithi 16, 21, 27, 30, 236, 238, 240, 263, 264, 269, 270, **278**, 281
spinosus 13, 17, 19, 20, 21, 22, 29, 59, 61, 62, **87**, 88, 93, 94, 98, 104, 112, 115, 128, 174
squamosus 13, 15, 19, 22, 30, 300, 301, 302, 305, 308, **319**, 320, 323, 324, 339
stansburiana stejnegeri, Uta 288
stejnegeri 70

taeniocnemis 32, 42, 45
taylori 29, 172
teapensis 16, 19, 21, 22, 30, 236, 240, 241, 247, **256**, 257, 261, 263, 264, 265, 266, 295, 306
tessellatus, Cnemidophorus tessellatus 155
thayerii 111
torquatus 28, 75, 222
tristichus, undulatus 12, 29, 173
Tropidolepis aeneus 353
  formosus 35
  grammicus 179, 184
  horridus 99, 106

microlepidotus 183
microlepidus 184
pleurostictus 179
scalaris 338
spinosus 87
variabilis 263
Tropidolepsis formosus 35
Tropidurus grammicus 179
spinosus 87

undulata, Ameiva 261
undulatus 12, 29, 173, 174
unicanthalis, 18, 20, 21, 30, 330, 332, 335, **349**, 350
Uta 29, 239
microlepidota 183
stansburiana stejnegeri 288
utiformis 14, 16, 18, 19, 20, 21, 30, 257, 263, 285, 324, **325**, 326

vandenburgianus, 12, 19, 30, **176**
variabilis, 12, 14, 15, 16, 18, 19, 20, 21, 22, 30, 236, 238, 239, 240, **262**, 263, 264, 269, 270, 271, 281, 282, 283
vigilis, Xantusia 155
virgatus, 18, 21, 29, 173, **176**
viviparus 32, 35, 40

wislizenii, Crotaphytus 155
woodi 29, 172

Xantusia vigilis 155

zosteromus 19, 29, 59, 63, 148, 168, **170**

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Sceloporus formosus formosus
Chilpancingo, Guerrero
Left: Female, MCZ 34228. Right: Male, MCZ 34230 (body, 76 mm.)

Sceloporus merriami annulatus
Glenn Spring, Texas
Left: Male, UMMZ 66181 (body, 50 mm.). Right: Male, UMMZ 66181 (body, 85.5 mm.)

Sceloporus asper
Uruapan, Michoacán
Left: Female, EHT 8678A (body, 73 mm.). Right: Male, EHT 8681 (body, 79.5 mm.)

Sceloporus salvini
Jalapa, Vera Cruz
Left: Female, USNM 6308 (body, 84.4 mm.). Right: Male, USNM 6308a (body, 84 mm.)

Sceloporus formosus malachiticus
Boquete, Panama
Left: Female, UMMZ 58030 (body, 83 mm.). Right: Male, UMMZ 58018 (body, 74 mm.)

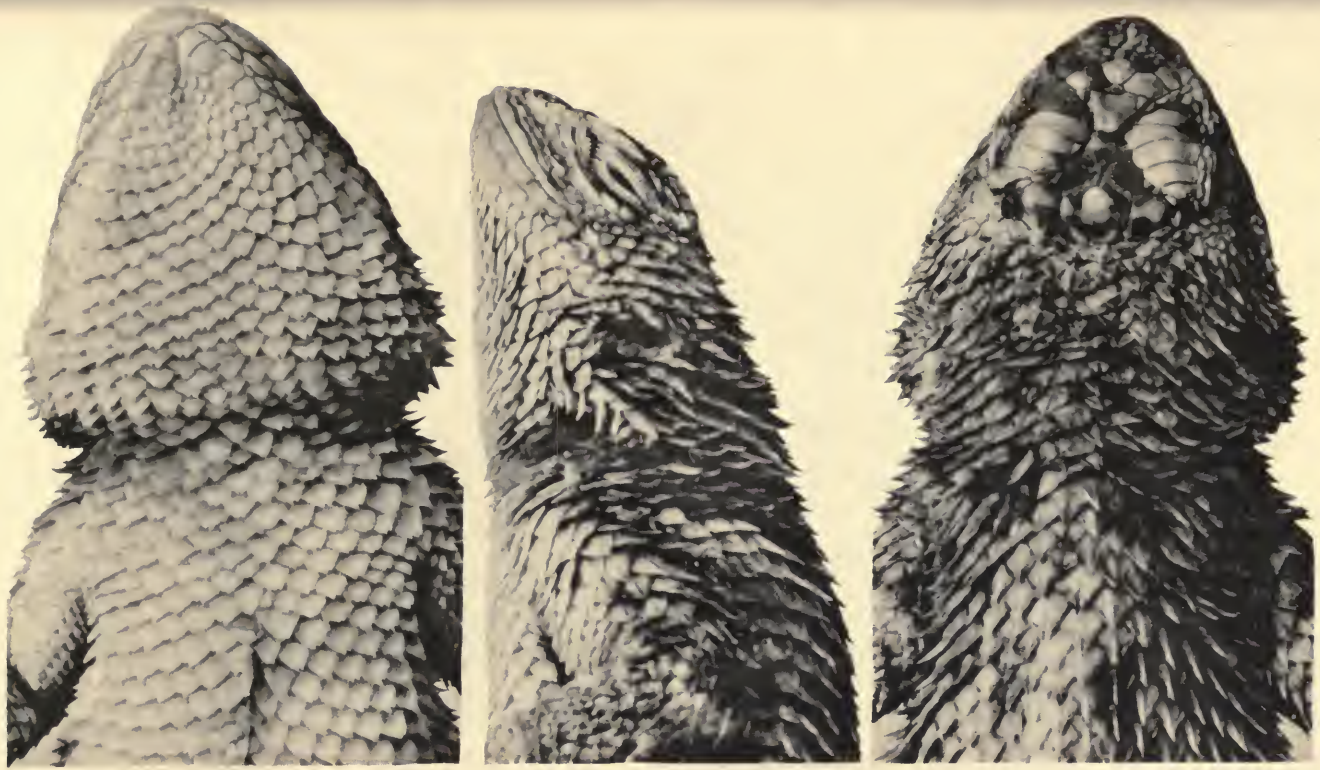
Sceloporus lundelli lundelli
Hacienda Balchacaj, Campeche
Left: Female, EHT 9954 (body, 79 mm.). Right: Female, EHT 9945 (body, 65.2 mm.)

Sceloporus orcutti licki
San Bartolo, Lower California
Male, UMMZ 56044 (body, 65 mm.)

Sceloporus lunaei
Guatemala
Female, USNM 25220 (body, 85 mm.)

Sceloporus lundelli gaigeae
Merida, Yucatan
Female, EHT 9944 (body, 86.5 mm.)

Sceloporus acanthinus
Type of *Sceloporus guentheri* (body, 72 mm.)



Sceloporus acanthinus
Head scales; from type of *Sceloporus guentheri*

Sceloporus edwardtaylori
Tehuantepec, Oaxaca
Male, UMMZ 81828 (body, 108 mm.)

Sceloporus melanorhinus
Hacienda El Sabino, Michoacán
Left: Female, EHT 8284 (body, 84.3 mm.). Right: Male, EHT 8295 (body, 92.7 mm.)

Sceloporus melanorhinus
Ventral views of specimens shown on Plate 9

Sceloporus spinosus spinosus

Left: Maravatio, Michoacán. Male, EHT 8433 (body, 104.4 mm.)
Center: El Salado, San Luis Potosi. Male, EHT 8447A (body, 77.8 mm.)
Right: Alseseca, Puebla. Female, EHT 8459 (body, 102 mm.)

Sceloporus horridus horridus

Chilpancingo, Guerrero
Male, EHT 8602A (body, 103.5 mm.)

Sceloporus horridus albiventris
Tepic, Nayarit
Male, EHT 8511B (body, 99 mm.)

Sceloporus horridus horridus
Cuernavaca, Morelos
Male, EHT 8569A (body, 99.2 mm.)

Sceloporus olivaceus
Rio Grande City, Texas
Female, EHT 4922 (body, 118 mm.)

Sceloporus heterolepis
Jalisco
From Boulenger

Sceloporus microlepidotus disparilis
Rio Grande City, Texas
Female, EHT 4965 (body, 61 mm.)

Sceloporus pictus

Left: Acultzingo, Puebla. Female, EHT 7629A (body, 48.2 mm.)
Center and right: Puebla. Male, EHT 7625A (body, 54.7 mm.). Dorsal and ventral views

Sceloporus megalepidurus

Totalco, Vera Cruz
Female, EHT 7598A (body, 48 mm.)

Sceloporus ferrariperezi binocularis
Between Pablillo and Alamar, Nuevo León
Female, ANSP 20020 (body, 45 mm.)

Sceloporus serrifer plioporus
Limon, Tamaulipas
Female, EHT 9411 (body, 95 mm.)

Sceloporus couchii

Left: Huasteca Cañon, Nuevo León. Male, EHT 7106 (body, 64 mm.)
Right: Sabinas Hidalgo, Nuevo León. Female, EHT 7070 (body, 53.3 mm.)

Sceloporus cozumelae
Cozumel Island, Yucatan
Left: Male, UMMZ 78573 (body, 51.2 mm.)
Right: Female, UMMZ 78573A (body, 44 mm.)

Sceloporus aeneus bicanthalis
Cruz Blanca, Vera Cruz
Male, EHT 7940A (body, 45.3 mm.)

Sceloporus scalaris scalaris
Mexico City, Mexico
Male, UMMZ 75821 (body, 55 mm.)

Sceloporus teapensis
San Agustin, British Honduras
Left: Male, UMMZ 80677 (body, 55.2 mm.)
Right: Female, UMMZ 80677A (body, 42.5 mm.)

Sceloporus variabilis variabilis

Left: Tierra Colorado, Vera Cruz. Female, EHT 7731A (body, 53.4 mm.)
Right: Las Vigas, Vera Cruz. Male, EHT 7752A (body, 62.5 mm.); dorsal markings unusually distinct

Sceloporus variabilis smithi
Near Tehuantepec, Oaxaca
Left: Male, UMMZ 81810 (body, 69.7 mm.)
Right: Female, UMMZ 81781 (body, 54.4 mm.)

Sceloporus chrysostictus

Left: Xcach Aguada, Yucatan. Male, UMMZ 125 (field no.) (body, 60.2 mm.)

Right: Chichen Itza, Yucatan. Female, UMMZ 22 (field no.) (body, 47.5 mm.)

Sceloporus squamosus

Tapachula, Chiapas

Left: Male, EHT 7615 (body, 51 mm.)

Right: Female, EHT 7617 (body, 51 mm.)

Sceloporus siniferus

Left: Between Rincon and Cajones, Guerrero. Female, EHT 7392A (body, 51.5 mm.)
Right: El Treinte, Guerrero. Male, EHT 7426A (body, 63.3 mm.)

Sceloporus utiformis

Left: Hacienda El Sabino, Michoacán. Male, EHT 7236A (body, 52.5 mm.)
Center: Uruapan, Michoacán. Female, EHT 7233A (body, 57.6 mm.)
Right: Uruapan, Michoacán. Male, EHT 7222A (body, 71.2 mm.)

Sceloporus jalapae

Left: Chazumba, Oaxaca. Female, EHT 7633 (body, 47.5 mm.)
Right: Canada de Morelos, Puebla. Male, EHT 7631A (body, 44.5 mm.)

Sceloporus nelsoni
Mazatlan, Sinaloa
Left and right: Male, EHT 7684E (body, 53.5 mm.)
Center: Female, EHT 7684A (body, 55 mm.)

Sceloporus pyrocephalus

Left: Hacienda El Sabino, Michoacán. Female, EHT 8126 (body, 54.2 mm.)
Right: North of Rio Balsas, Guerrero. Male, EHT 8094A (body, 62.2 mm.)

Sceloporus pyrocephalus

Ventral surfaces of specimens shown in Plate 29

Sceloporus gadoviae
Hacienda El Sabino, Michoacán
Left: Female, EHT 8228A (body, 57.2 mm.)
Right: Male, EHT 8225 (body, 74.2 mm.)

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